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WETLAND MONITORING REPORT FOR THE YEAR 2000

AREA 1, PHASE I WETLAND MITIGATION PROJECT

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

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U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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LIST OF ACRONYMS AND ABBREVIATIONS

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A1PI	Area 1, Phase I
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FEMP	Fernald Environmental Management Project
PVC	polyvinyl chloride

EXECUTIVE SUMMARY

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The U.S. Department of Energy (DOE) is required by Section 404 of the Clean Water Act to replace wetlands which have been disturbed or destroyed on the Fernald Environmental Management Project (FEMP). The DOE negotiated a mitigation ratio of 1.5:1 acres with the regulatory agencies to replace 10 acres of wetlands. This mitigation ratio results in a regulatory commitment of 15 acres of mitigation wetlands.

To address a portion of the 15-acre mitigation requirement, the DOE constructed approximately 6 acres of wetlands in 1999 within the northeast portion of the site [Area 1, Phase I (A1PI)] to replace wetlands which have been destroyed by cleanup activities. This wetland system consists of an 8-basin freshwater cascade connected by gravity-flow channels with varied vegetative cover (trees, shrubs, herbs).

All wetland basins are exhibiting good water retention capabilities. Water quality data provides indications of a healthy and balanced system. Prevalence of in-migrating wildlife populations also indicate a functioning ecosystem.

In response to 80 percent survival requirements for woody stock, a replanting strategy was implemented to install approximately 200 trees and 400 shrubs in October and November 2000. This strategy focused on the functionality of the whole system, with efforts concentrated on those areas exhibiting a deficiency in function. Functional categories assessed for replacement were cover, mast, diversity, aesthetics and fruit.

Additional planting will be required in Spring 2001 for the installation of shrubs which were not available in Fall 2000 and for the installation of herbaceous wetland plugs in Basins 3 and 5 to address lack of cover. Monitoring data collection and visual observations will continue over the next growing season.

1.0 PURPOSE OF REPORT

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This report summarizes the first on-site evaluation of a 5-year wetland monitoring program for 6 acres of replacement wetlands constructed to partially offset 15 acres of mitigated wetlands which were derived from 10 acres of unavoidable wetland loss from Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) related activities. This monitoring report is being conducted in accordance the A1PI Conceptual Wetland Mitigation Plan (DOE 1999) submitted to the Agencies on March 3, 1999. This monitoring report was also developed to comply with U.S. Environmental Protection Agency's (EPA's) Clean Water Act 404 (b)(1) Guidelines promulgated in 40 Code of Federal Regulations (CFR) Part 230. The purpose is to determine the progression of replacement features and to provide recommendations, as necessary, for design modifications in the early years to improve or enhance wetland functions and ensure the wetland replacement acreage is met.

The project location is shown on Exhibit 1.

2.0 WETLAND MONITORING

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2.1 WETLAND MONITORING REQUIREMENTS

The EPA's Clean Water Act 404 (b)(1) Guidelines promulgated in 40 CFR Part 230 require replacement wetlands to compensate for unavoidable impacts by CERCLA activities. The specifics of the monitoring plan are outlined in the A1PI Wetland Mitigation Design Plan submitted to the agencies on March 3, 1999. The constructed wetlands are to be monitored during the growing season (March through October), with annual report submissions for a 5-year period to document wetland vegetation, soils, and hydrology development. By the end of the 5th monitoring year a determination will be made regarding further monitoring.

The monitoring program is based upon the wetland design and requires documentation that the constructed wetland system is performing as a natural system. Monitoring of performance includes two aspects: 1) survival and cover assessment of woody and herbaceous vegetation in the first two years if requirements are met; and 2) Wildlife observations and collection of water and soil data to assess development of the system.

2.2 DESCRIPTION OF WETLAND MITIGATION AREA

The mitigation site is located in the northeast corner of the FEMP (Exhibit 1). The site was previously a grazed pasture and was slightly modified during cleanup as a result of surface soil removal. The mitigation area is bordered to the west by the North Access Road and on the east by the property fence. Elevations range from 620 to 597 Mean Sea Level with approximately 20 acres of receiving watershed. Surface water reaches the mitigation area by overland flow and travels through each basin by connected gravity-flow channels. All wetland basins, with the exception of Basin 8 (wet prairie), were designed to contain open, palustrine emergent features.

2.3 CHARACTERISTICS OF EACH WETLAND BASIN

2.3.1 Basin 1

Basin 1 is approximately 1.02 acres and is situated at the lowest elevation of the mitigation area (see Appendix A, Photographs 9 through 11). Hydrology is a combination of natural drainage and collection of drainage from all basins, with the outlet releasing water to an off-property swale. Water control devices consist of a buried log and coir fabric structure at the outlet and a pole drain which receives a

slow seep from Basin 5. Pre-cast concrete headwalls allow water retention and controlled water release from Basins 2 and 6. Wetland classification types designed for this basin consist of wet forest, shrub swamp, herbaceous meadow and open water.

2.2.2 Basin 2

Basin 2 is approximately 1.29 acres and is situated above Basin 1 and below Basin 3 (see Appendix A, Photographs 12 through 14). Hydrology is a combination of natural drainage and collected drainage from Basins 3 and 4. Water control devices consist of pre-cast concrete headwalls at the inlet and outlet to allow water retention and controlled flow through the meandering channel of this basin. Wetland classification types designed for this basin consist of wet forest, shrub swamp, herbaceous meadow, wet prairie, and open water.

2.2.3 Basin 3

Basin 3 is approximately 0.83 acres and is situated above Basin 2 and below Basin 4 (see Appendix A, Photographs 15 through 17). Hydrology is a combination of natural drainage and collected drainage from Basin 4. Water control devices consist of a log and coir fabric structure at the inlet and a pre-cast concrete headwall at the outlet to allow water retention and controlled flow through the meandering channel of this basin. Wetland classification types designed for this basin consist of wet forest, shrub swamp, herbaceous meadow and open water.

2.3.4 Basin 4

Basin 4 is approximately 0.81 acres and is situated above Basin 3, placing Basin 4 at the highest elevation of the project (see Appendix A, Photographs 18 through 20). Hydrology is natural drainage to the meandering channel with a log and coir fabric structure at the outlet to allow water retention prior to releasing flow to Basin 3. Wetland classification types designed for this basin consist of shrub swamp, herbaceous meadow and open water.

2.3.5 Basin 5

Basin 5 is approximately 0.23 acres and situated adjacently west of Basin 1 (see Appendix A, Photograph 5). Hydrology is a combination of natural drainage and a culvert under the road, which accepts drainage from the west side of the road. Water control devices consist of a pole drain to provide water retention by allowing a slow gradual seep to basin 1 and an emergency spillway lined with coir

fabric. Wetland classification types designed for this basin consist of open water, shrub swamp and future development of herbaceous meadow.

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2.3.6 Basin 6

Basin 6 is approximately 1.44 acres and is situated above Basin 1 and below Basin 7 (see Appendix A, Photographs 5 through 7). Hydrology is a combination of natural drainage and collected drainage from Basin 7. Water control devices consist of a log and coir fabric structure at the inlet and a pre-cast concrete headwall at the outlet to allow water retention and controlled flow through the meandering channel of this basin. Wetland classification types designed for this basin consist of wet forest, shrub swamp, herbaceous meadow, wet prairie, and open water.

2.3.7 Basin 7

Basin 7 is approximately 0.48 acres and is situated above Basin 6 and below Basin 8 (see Appendix A, Photographs 2 and 3. Hydrology is a combination of natural drainage and collected drainage from Basin 8. Inlet drainage is from a coir fabric covered swale connecting Basin 8 and the outlet is a log and coir fabric structure, which allow water retention and water flow through the forked channel of this basin. Wetland classification types designed for this basin consist of wet forest, shrub swamp, herbaceous meadow, wet prairie, and open water.

2.3.8 Basin 8

Basin 8 is approximately 0.14 acres and is situated above Basin 7 (see Appendix A, Photograph 1). Hydrology is from natural drainage, which is collected and released through a coir fabric covered swale to Basin 7. Wetland classification types designed for this basin consist of shrub swamp and wet prairie.

2.4 WETLAND MONITORING METHODS

2.4.1 Woody Species

Each individual forest and shrub patch was systematically assessed for mortality (Appendix B). The criteria for mortality was 50 percent leaf cover in the canopy for trees and 50 percent leaf cover of the original shrub planting. Specimens not meeting these criteria were determined to be dead and were counted and recorded. Those woody plants which did not survive were computed against the total number of specimens planted in each respective patch to determine if survival requirements were met.

The A1PI Conceptual Wetland Mitigation Plan contains survival requirements of 80 percent. If survival requirements were not met then replacement stock of the same specifications as the original material or by substitution (unavailability of stock) were required. Replacement planting was implemented using an approved strategy by the Agencies and Natural Resource Trustees (August 31, 2000 letter). This strategy allowed some patches to remain below 80 percent survival to focus on other patches most deficient in cover, food source and buffering as agreed upon by the Agencies and Natural Resource Trustees. The replacement strategy placed priority on wetland patches to achieve survival requirements, however, some wetland patches were not planted due to inaccessibility. The upland patches were replanted based on the need for buffer establishment along the western portion of the project. The second year of mortality counts will be based upon the current status of each upland and wetland planting patch (Appendix C), which is resultant of the replanting effort in Fall 2000. Patches which were not replanted and did not experience survival rates below 80 percent, will not be monitored after the second year in accordance with the A1PI Conceptual Wetland Mitigation Plan. All patches which are replanted will be monitored for at least two growing seasons beyond the date of replacement to ensure the 80 percent survival rate is met. Patches which do not achieve survival requirements will be assessed for replacement planting based on the revised planting strategy outlined in Section 2.5.

2.4.2 Herbaceous Species

Cover estimates for herbaceous meadow and wet prairie communities were conducted at the end of the growing season (October). Cover estimates of upland prairie communities were not conducted due to little or no cover as a result of the 1999 drought. A walking survey of each basin was conducted using visual estimates of the amount of basin area covered by a perpendicularly projected outline of native vegetation. Individual patches were difficult to distinguish and were not assessed due to impacts of the drought on the germination of marsh and wet prairie seed mixes specified in the design, resulting in invasion of aggressive species within the bottom of most basins. Cover estimates will assess each basin area using the following categories: 0 to 5 percent (sparse); 5 to 25 percent (medium-sparse); 25 to 50 percent (medium); 50 to 75 percent (medium-dense); 75 to 100 percent (dense) (Daubenmire 1959).

Stereographic photographs were not taken due to logistical difficulties associated with a large number of patches not meeting the 80 percent cover requirements and the difficulty of distinguishing patches.

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2.4.3 Water Levels

Basin water level depths were measured monthly from March through October 2000. A staff gauge was manually inserted in the shallow portions of Basins 1, 2 and 4 to measure water levels to ensure the basins are capable of supporting continued maturation of the wetland system.

To assess the water table depth, shallow monitoring wells constructed of 1-inch Schedule 40 polyvinyl chloride (PVC) pipe were installed in the top 18 inches of each basin. Water table depths were measured monthly from March through October 2000 using a water level meter with an alarm system.

2.4.4 Water Quality

Samples were collected bi-monthly (March through September) from Basins 1, 2, 4, 5 and 6, where perennial ponding was expected. Each sample was collected by submerging a polyethylene dipper into the water in a manner to avoid disturbing sediment from the basin bottom. The water was transferred to a stainless steel beaker until enough water was collected for measurement. A Horiba® U-10 Water Quality Probe was submersed in the beaker until such time parameters were stabilized. Parameters measured included pH, dissolved oxygen, conductivity, temperature, turbidity, odor and color.

2.4.5 Wetland Soils

Soils in each of the wetland basins were amended with organic material (woodchips, sawdust, bio-solids). Starting in monitoring year 2001, soil samples will be taken annually at appropriate depths from two locations in each basin during the month of May and compared to Munsell color charts. These sample areas will be representative of non-hydric conditions and will be marked to monitor development of hydric soils.

2.4.6 Wildlife Observations

Visual and auditory observations were made throughout the growing season and recorded. Birds and mammals were the main emphasis with notations of herptefauna. Aquatic macroinvertebrates will be sampled in May and June 2002 for indicator species of water quality.

2.4.7 Infrastructure Inspection and Maintenance

All structures such as goose fence, pole drains, headwalls were inspected and maintained. Invasive and exotic plant species were removed as necessary.

2.4.8 Weather Conditions

Monthly precipitation data obtained from the FEMP Meterological Tower during project implementation (1999) and monitoring (2000) is summarized in Tables 2-1 and 2-2:

TABLE 2-1
PRECIPITATION DATA FOR PROJECT AREA DURING IMPLEMENTATION

Month/Year	Precipitation	Above(+) / Below (-) Normal
March 1999	2.03	-2.21
April 1999	3.67	-0.08
May 1999	1.64	-2.64
June 1999	4.90	+1.06
July 1999	1.75	-2.49
August 1999	2.37	-0.98
September 1999	1.12	-1.76
October 1999	2.46	-0.4

The precipitation data indicates a severe drought during the spring and fall planting season (Table 2-1). This resulted in mortality of woody stock, invasion of herbaceous species in the bottom of the basins and inhibition of germination of the emergent seed mixes.

TABLE 2-2
PRECIPITATION DATA FOR PROJECT AREA DURING WETLAND MONITORING PERIOD

Month/Year	Precipitation	Above(+) / Below (-) Normal
March 2000	4.0	-0.24
April 2000	4.66	+0.91
May 2000	3.83	-0.45
June 2000	4.07	+0.23
July 2000	2.78	-1.46
August 2000	2.21	-1.14
September 2000	3.62	+0.74
October 2000	3.32	+0.46

The precipitation data indicates normal precipitation during the spring season, with a dry summer season approximately 2.37 inches below normal, requiring watering of woody stock exhibiting signs of survival (Table 2-2). Above normal conditions in the fall season provided moist soil conditions for fall replacement planting.

2.5 WETLAND MONITORING RESULTS

2.5.1 Woody Species

Trees and shrubs planted in each basin are included in Appendix C. Factors such as the drought of 1999 and deer pressure inhibited plant survival of some areas (< 80 percent) and necessitated replacement planting in Fall 2000. Deer damage was assessed during the first year of plant installation (August through October 1999) for browsing and rubs. Approximately 39 percent of plants were browsed, 4 percent rubbed and 17 percent destroyed.

The replanting strategy deviated from the original individual patch replacement by using an adaptive management approach. This strategy focused on the functionality of the whole system, with all wetland forest and wetland shrub areas assessed for replanting to achieve 80 percent survival. However, not all wetland patches were replanted due to inaccessibility of transporting woody stock to remote wetland areas. The upland forest and upland shrub areas were replanted based upon exhibition of a deficiency in function irregardless of meeting survival requirements. It was determined that concentration of upland buffer establishment along the western portion of the project would provide isolation for the system. Functional categories assessed for replacement were cover, mast, diversity, aesthetics and fruit. A decision was made to increase the replanting effort to reflect 85 percent survival in an effort to minimize the need for future planting.

On October 30, 2000, the initial planting of approximately 206 trees and 409 shrubs were planted over a period of four weeks. Tree tubes were placed around the trunk of each tree to protect from deer rubs and garlic sticks were placed on all trees and around shrub patch perimeters to deter browsing. Approximately 94 shrubs identified in the replacement planting strategy were not available from the nursery industry. Purchase of these shrubs will be attempted to accommodate installation in Spring 2001. Suitable substitutes will be provided for those shrubs which are unavailable for purchase and will be selected based on function. Appendix D identifies tree and shrub species planted in Fall 2000.

2.5.2 Herbaceous Species

Herbaceous native wetland cover is below the 80 percent cover requirement in all basins. Basins 3 and 5 are most lacking in cover and will be addressed in Spring 2001 with continuation of visual observations

in the remaining basins. Cover estimates are contained in Appendix E. Upland herbaceous areas are being addressed as outlined in Section 2.7.

2.5.3 Water Levels

Staff gauge manual insertion measurements indicate water retention is occurring as evidenced by consistent water depths in Basins 1, 2, and 4 throughout the growing season (Appendix F). These basins are exhibiting capabilities of supporting continued maturation of the wetland system.

Measurements from the shallow monitoring wells indicate the water table is above or near the surface in most basins (Appendix F). The driest basins were Basins 6 and 8, which only exhibit water in the root zone in March and October 2000. This may be due to lack of surface water feed in Basin 8 and an isolated function of the monitoring well location in Basin 6. The monitoring well is located between two open water areas which retain water for most of the year. In addition, intentional flooding of Basin 6 to address invasive species reveals water retention within Basin 6.

2.5.4 Water Quality

Water quality was collected from Basins 1, 2, 4, 5 and 6. Overall, water quality testing indicates a balanced system. No visual signs of salt accumulation, such as, crustation of crystals, were observed in the basins as a result of using salt for de-icing on nearby roadways. Beginning in 2001, water quality will be monitored in May and September through the 5-year period. Water quality results are included in Appendix G of this report.

2.5.5 Wetland Soils

Soil samples were not collected due to the hardness of the ground surface in most basins and therefore all basins could not be assessed during the same monitoring year. Soil samples will be collected in May and June 2001 within areas of each basin representative of non-hydric conditions and compared to Munsell color charts. Visual observations indicate that areas within some basins are beginning to exhibit hydric soil characteristics.

2.5.6 Wildlife Observations

Approximately 32 species of birds, four species of herpetofauna and five species of mammals were observed. Evidence of nesting within the bird boxes was displayed by wrens, bluebirds, mallards, tree

swallows and house sparrows. Bat guana was observed in the roost cavity of one bat box. Observations and nest activity are included in Appendix H.

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2.5.7 Infrastructure Inspection and Maintenance

Goose fence was dismantled in Summer 2000 due to inundation of monofilament line across deep water areas and root establishment by herbaceous plugs around the shallow water areas. Invasive species such as cattails, johnson grass, queen-anne's lace and thistle were either mechanically removed with a weed whip or chemically removed with spot treatment. Some basins were back flooded to eliminate red and white clover.

2.5.8 Monitoring Schedule

The 5-year plan for implementing monitoring activities is included in Appendix I.

2.6 SUMMARY OF FINDINGS

Total constructed wetland area for the project is 6.24 acres, with 8.76 acres remaining to be mitigated. This project was designed and implemented using ecological restoration principles, with the intent to mimic a near approximation of historic natural conditions. Most wetland basins appear to be developing successful wetland elements. Water depth levels in the deep ponds and surface water levels in the shallow ponds are exhibiting good retention. Water quality results indicate a balanced system. Replacement planting of trees and shrubs during Fall 2000 was due to the drought of 1999 and high deer pressure. The drought also caused low germination of emergent seed mixes which caused establishment of aggressive and non-native herbaceous species. Further monitoring is required to document germination of herbaceous species in the bottom of each basin.

2.7 POTENTIAL PROBLEMS REQUIRING FURTHER EFFORTS

Winter seeding of upland forbs was conducted along the western perimeter to address traffic ruts from fall planting. These areas were hand raked and broadcast by hand with a sand carrier. The intent is to provide drifts of single species to improve aesthetics. The following forbs were planted in alternating drifts: Butterflyweed (*Asclepias tuberosa*); Bergamot (*Monarda fistulosa*); Pale Purple Coneflower (*Echinacea pallida*); Black-Eyed Susan (*Rudbeckia hirta*) and White False Indigo (*Baptisia leucantha*).

Herbaceous cover in Basins 3 and 5 are mostly devoid of vegetative cover and will require installation of grasses and forbs as outlined in Table 2-3:

TABLE 2-3
PLUGS FOR SPRING 2001 PLANTING

Grasses	Number of Plugs
Woolgrass (*Scirpus cyperinus)*	192
Blue Joint Grass (*Calamagrostis canadensis)*	192
Bottlebrush Sedge (*Carex lurida)*	192
Fox Sedge (*Carex stipata)*	192
Dark Green Bulrush (*Scirpus atrovirens)*	192
Prairie Cordgrass (*Spartina pectinata)*	192
Wildflowers	
Red Milkweed (*Asclepias incarnata)*	128
Wild Senna (Cassia hebecarpa)	96
Great Blue Lobelia (*Lobelia siphilitica)*	128
Cardinal Flower (*Lobelia cardinalis)*	96
Bergamot (*Monarda fistulosa)*	96
Sweet Joe-Pye Weed (*Eupatorium maculatum)*	128

Approximately 94 shrubs were not available for Fall 2000 planting. A second attempt will be made to order these species for Spring 2001 installation. Individual species numbers are provided in Table 2-4:

TABLE 2-4
SHRUBS FOR SPRING 2001 PLANTING

Shrubs	Number
Black Currant (*Ribes americanum)*	46
Pasture Rose (*Rosa caroliniana*)	15
Maple-Leaved Viburnum (*Viburnum acerifolium)*	14
Alternate-Leaved Dogwood (*Cornus alternifolia)*	19

Invasive plant species will continue to be monitored. Physical and chemical corrective actions will be implemented as necessary.

REFERENCES

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Daubenmire, R., 1959, "A Canopy-Coverage Method of Vegetational Analysis," Northwest Science, Volume 33, Number 1:43-63.

U.S. Department of Energy, 1999, "Conceptual Wetland Mitigation Plan for the Area 1, Phase I Mitigation Site," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

EXHIBIT 1. LOCATION OF THE AREA 1, PHASE 1 WETLAND MITIGATION PROJECT AREA

APPENDIX A

PHOTOGRAPHS

Aerial view of the wetland mitigation project looking northwest.

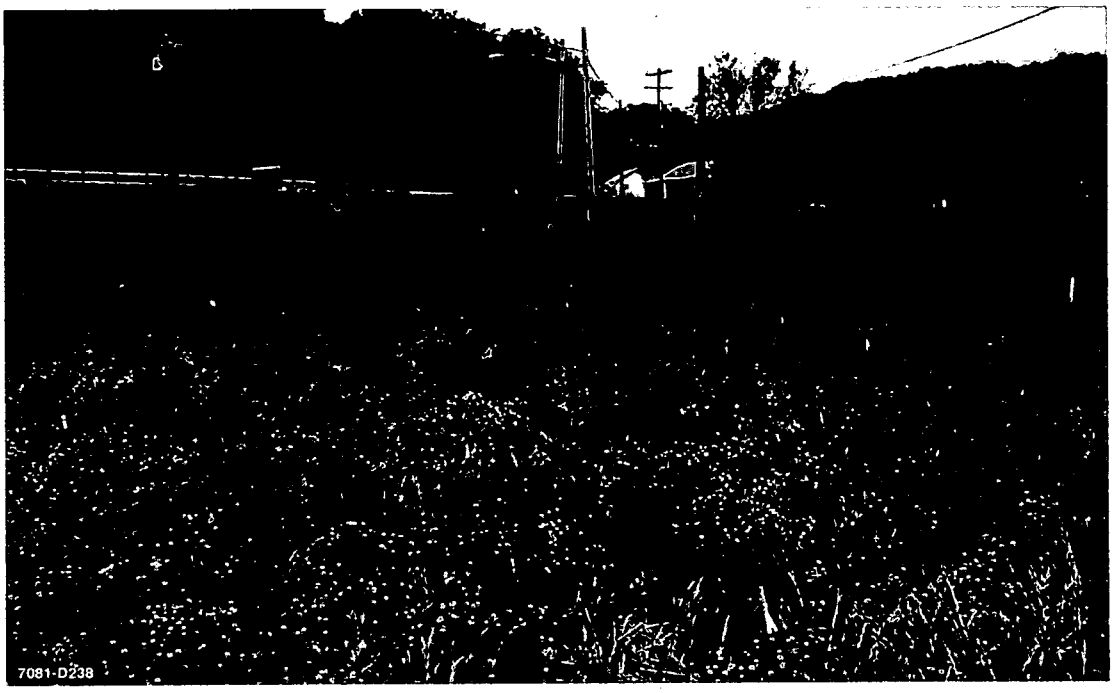

Photo #1: Basin 8 – View North

Photo #2: Basin 7 – View East

Photo #3: Basin 7 – View South

Photo #4: Basin 6 – View South

Photo #5: Basin 6 – View Southwest

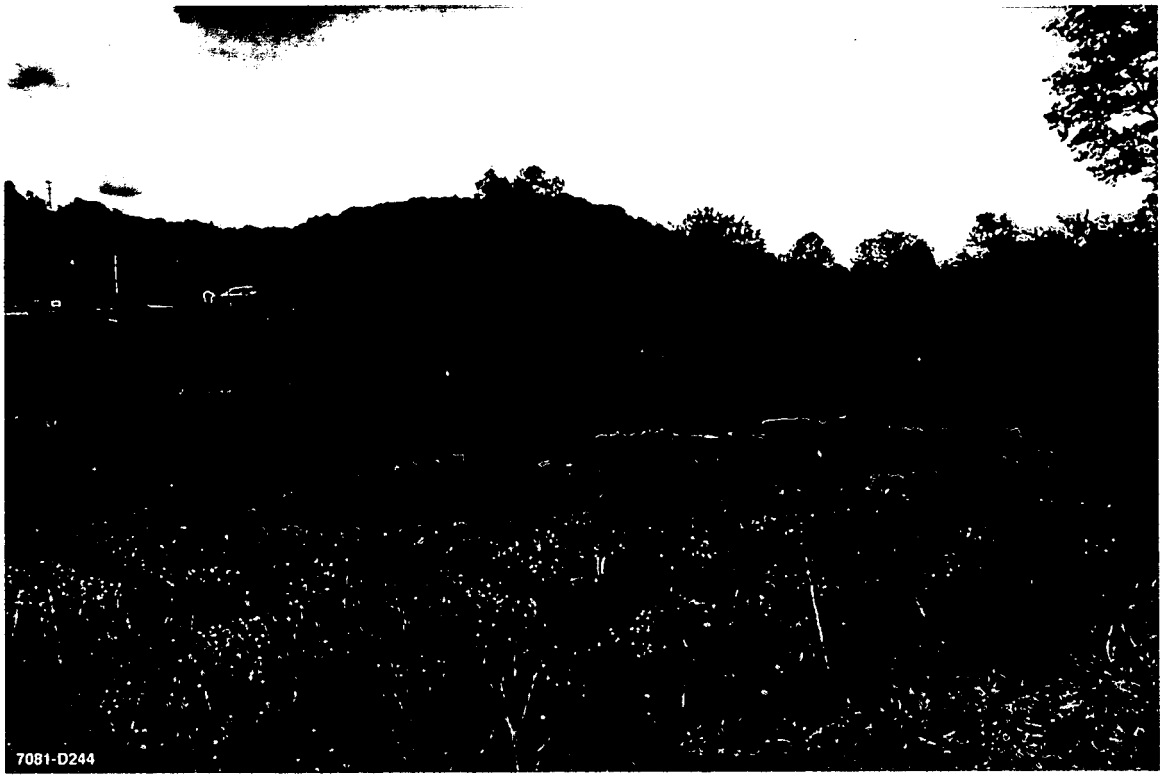

Photo #6: Basin 6 – View Northeast

Photo #7: Basin 6 – View Northwest

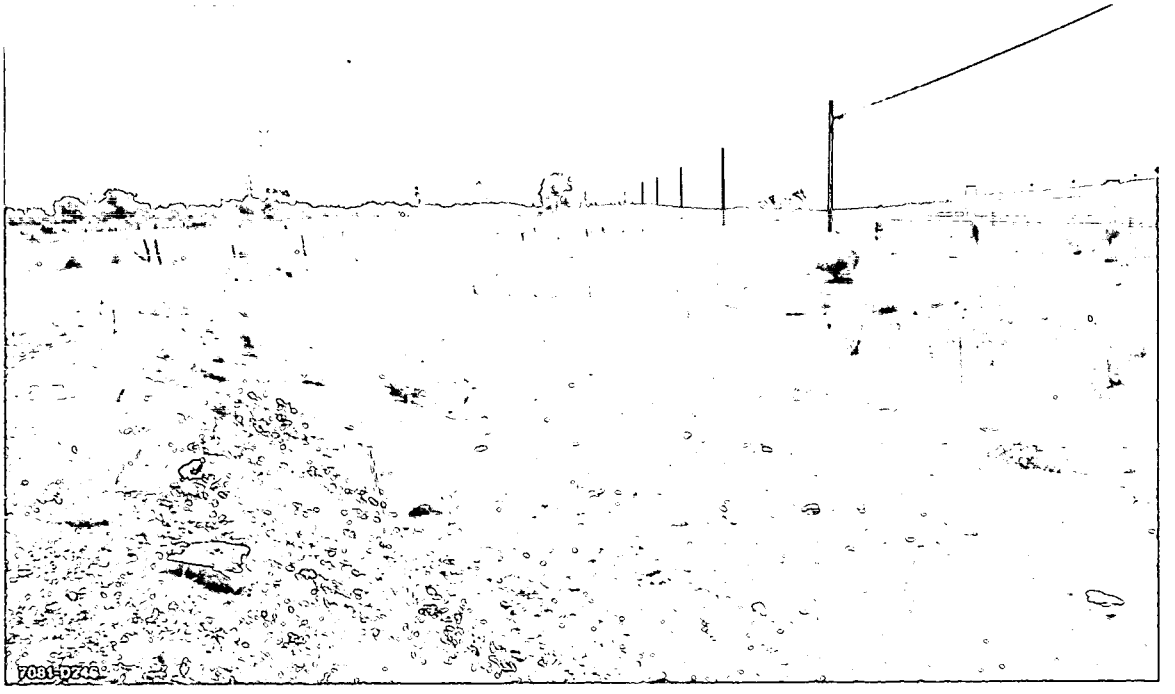

Photo #8: Basin 5 – View South

Photo #9: Basin 1 – View North

Photo #10: Basin 1 – View West

Photo #11: Basin 1 – View South

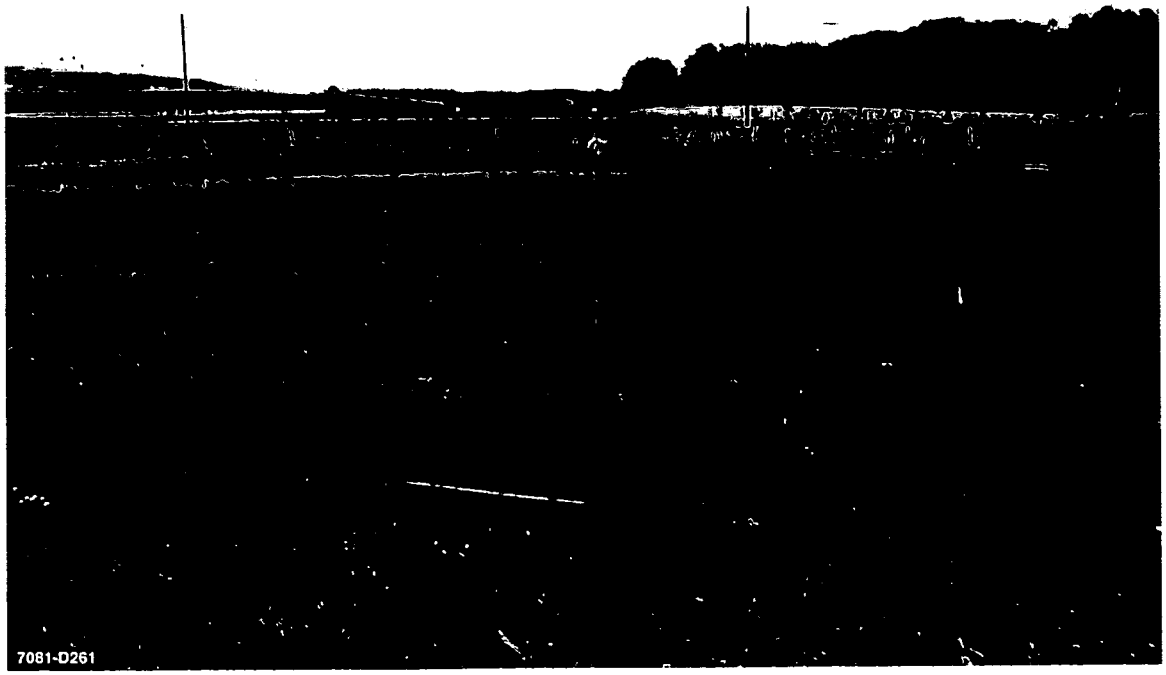

Photo #12: Basin 2 – View West

Photo #13: Basin 2 – View East

Photo #14: Basin 2 – View North

Photo #15: Basin 3 – View Southeast

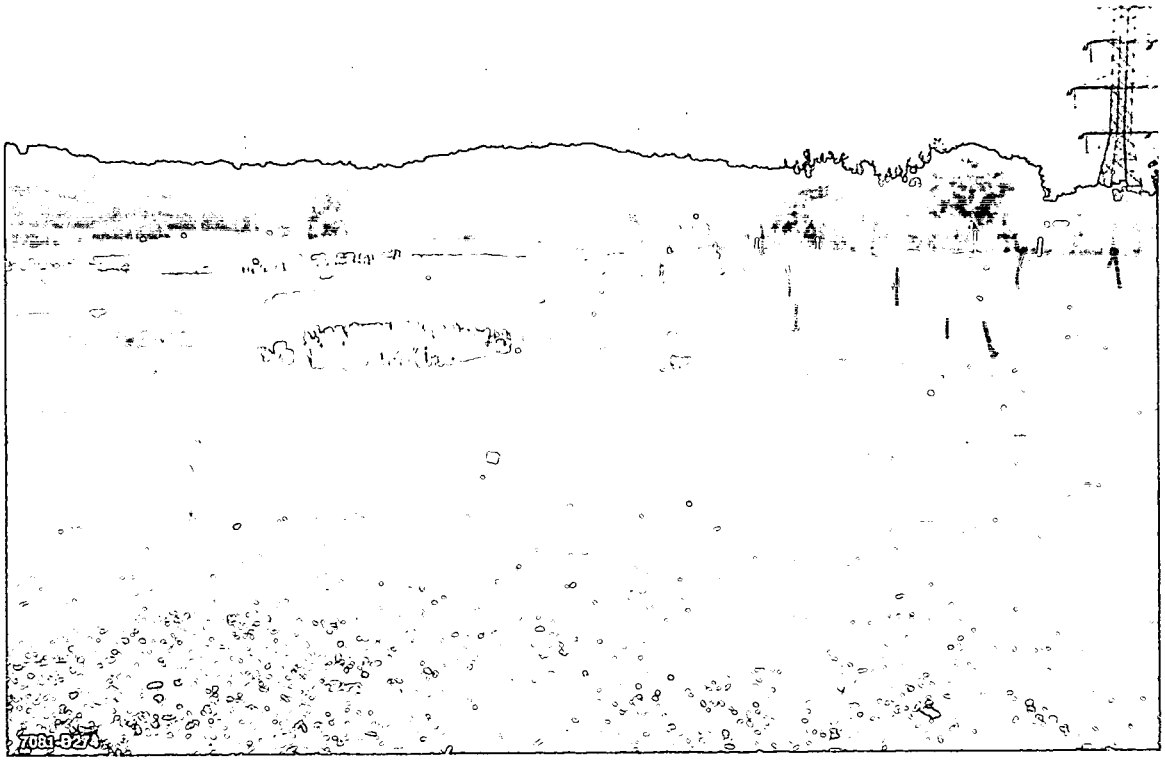

Photo #16: Basin 3 – View North

Photo #17: Basin 3 – View Northeast

Photo #18: Basin 4 – View Northeast

Photo #19: Basin 4 – View Southeast

Photo #20: Southern Extension of Basin 4 – View South

Photo #1: Basin 8 – View North

Photo #2: Basin 7 – View East

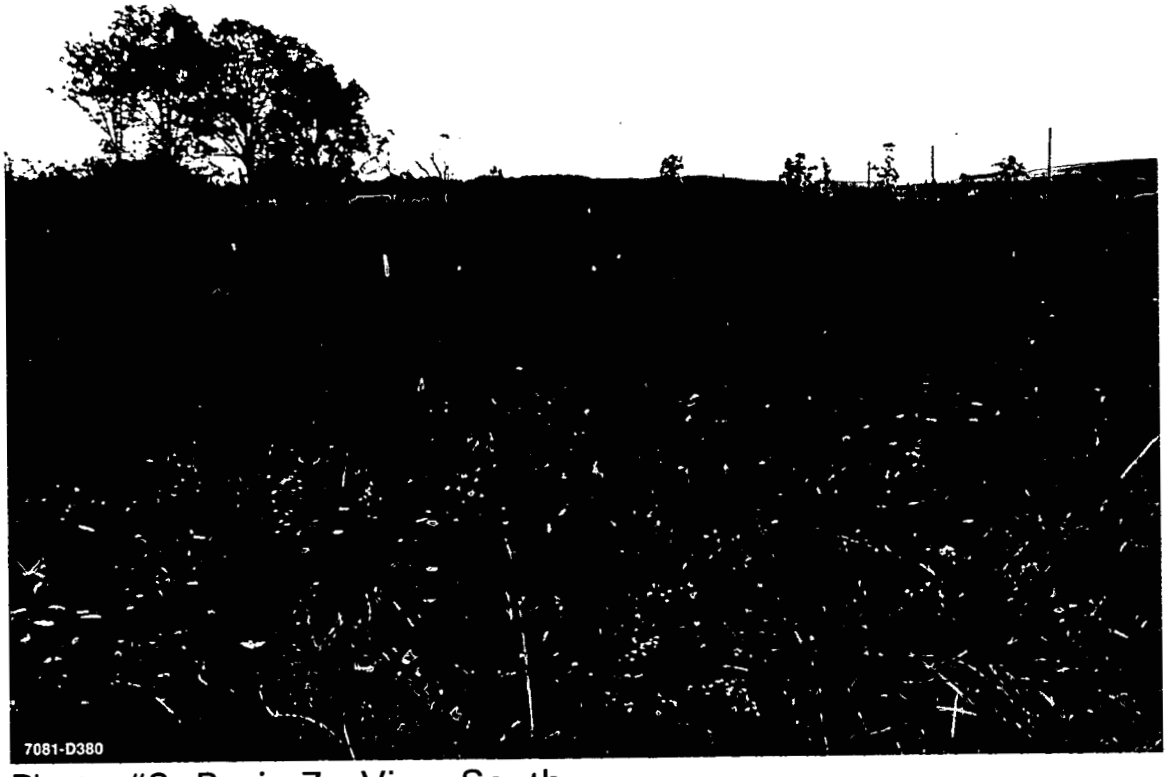

Photo #3: Basin 7 –View South

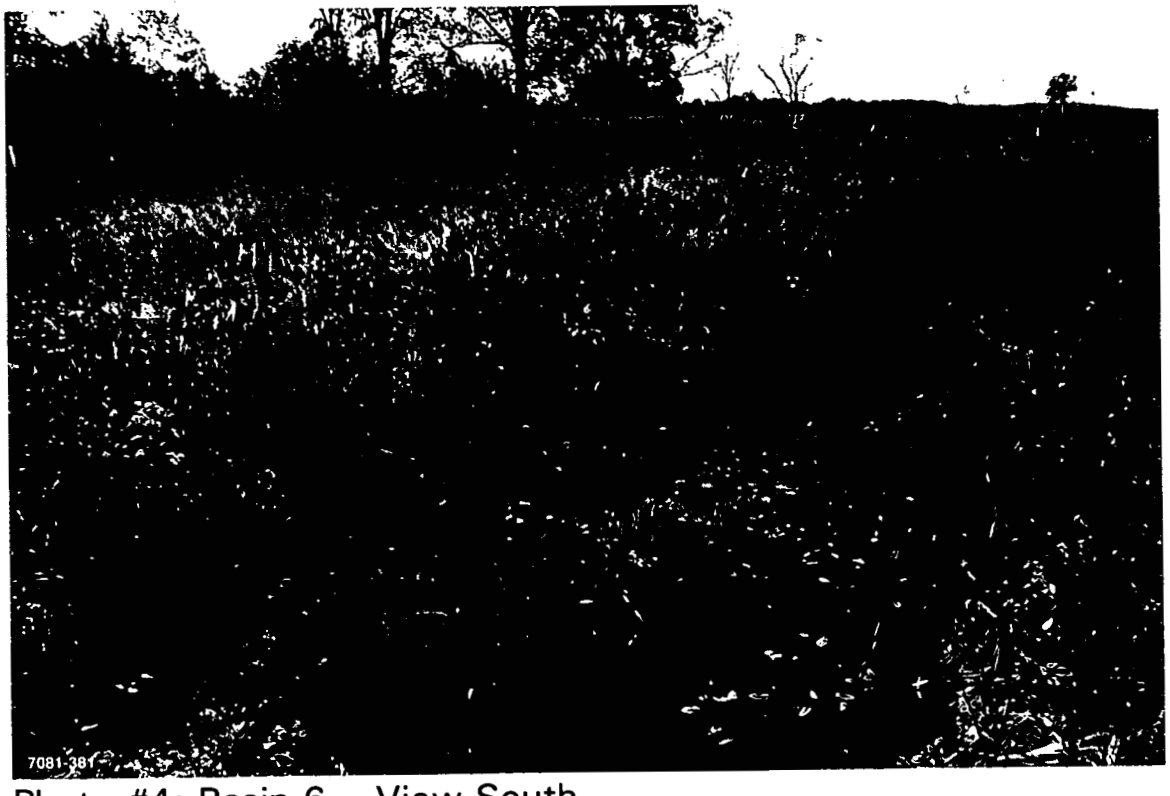

Photo #4: Basin 6 – View South

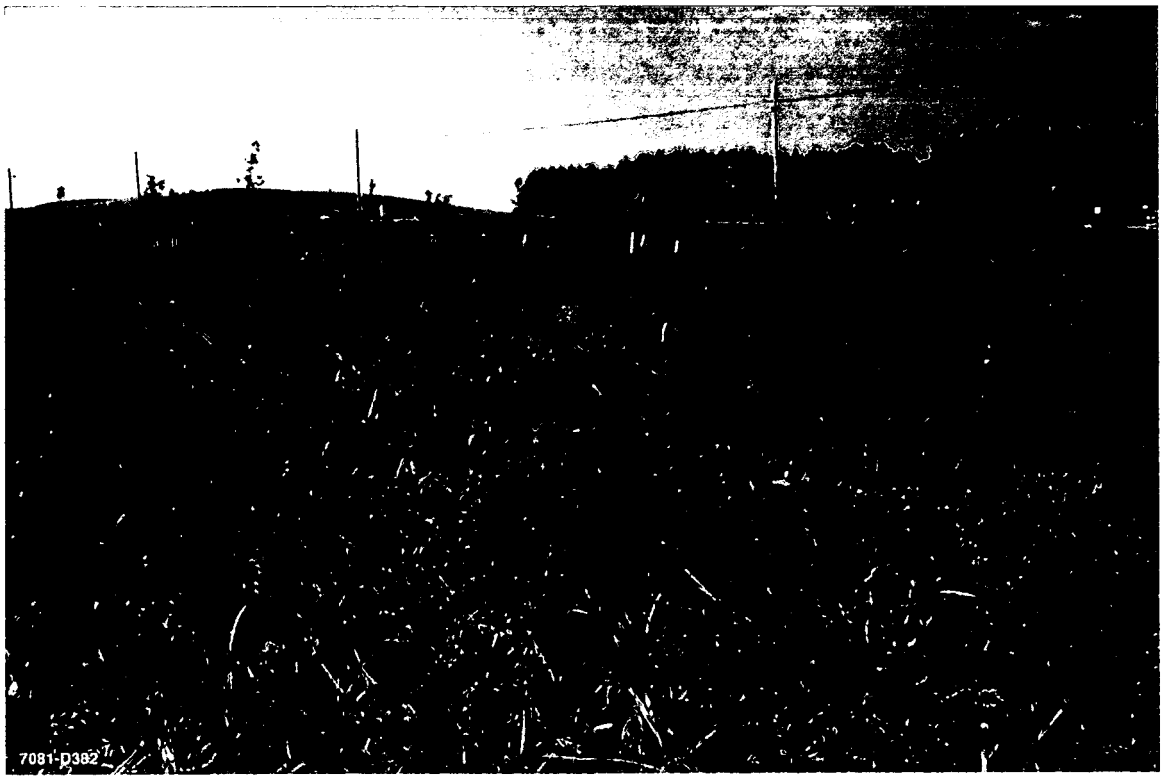

Photo #5: Basin 6 – View Southwest

Photo #6: Basin 6 – View Northeast

Photo #7: Basin 6 – View Northwest

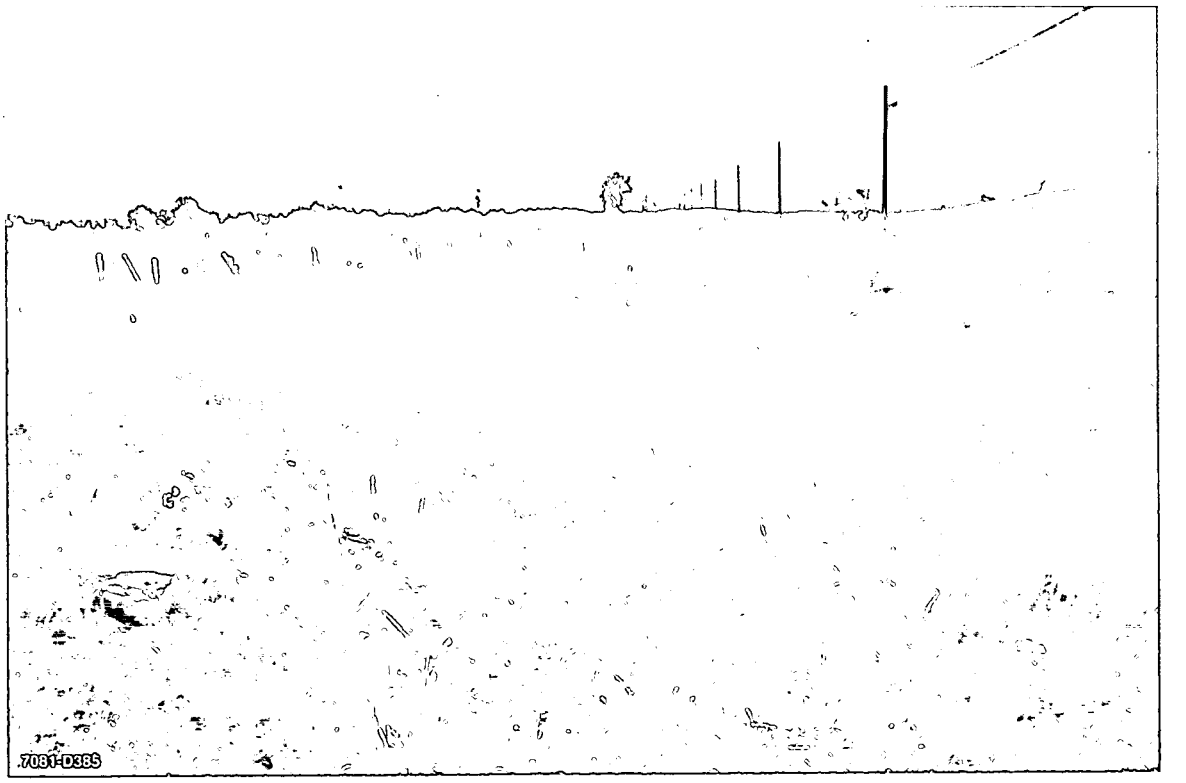

Photo #8: Basin 5 – View South

Photo #9: Basin 1- View North

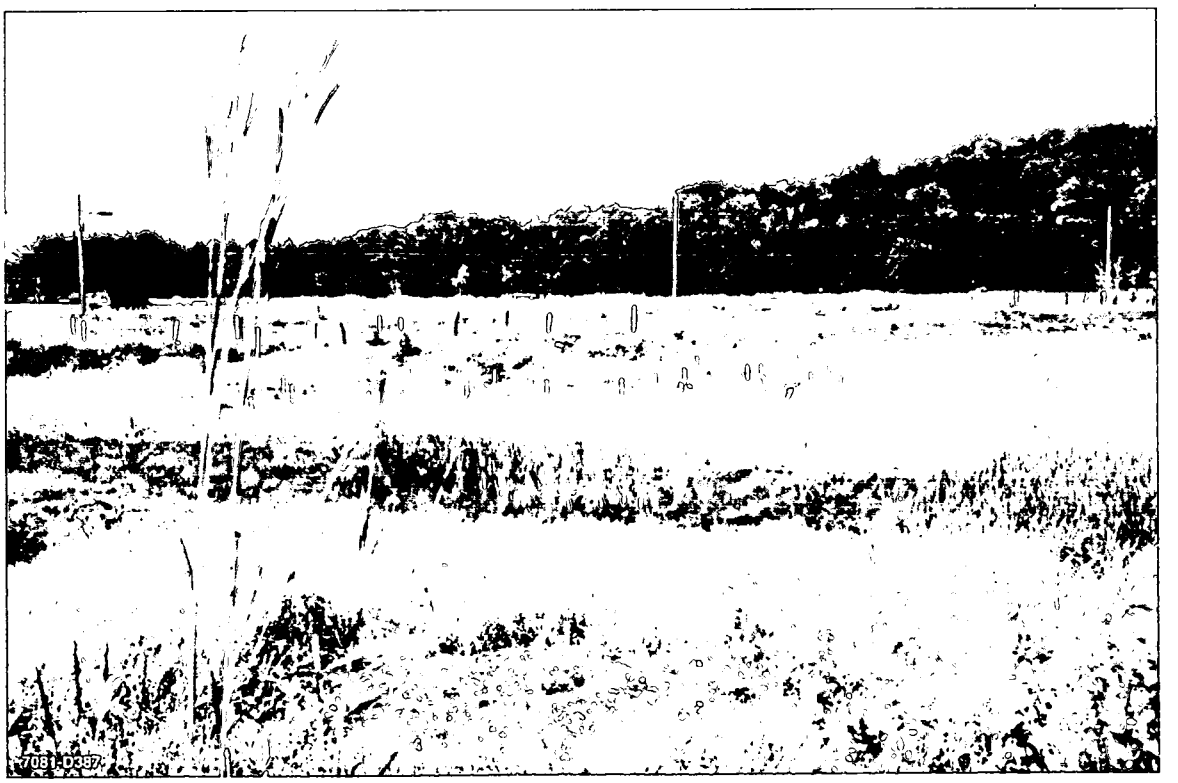

Photo #10: Basin 1- View West

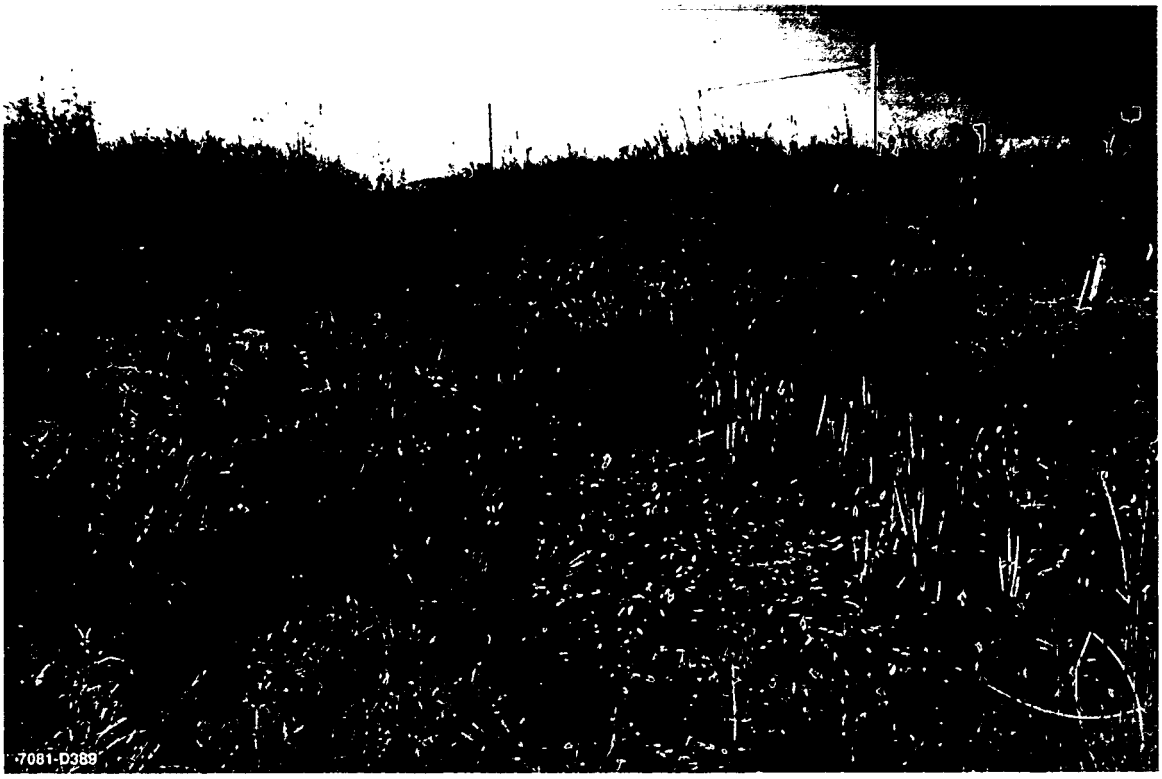

Photo #11: Basin 1 – View South

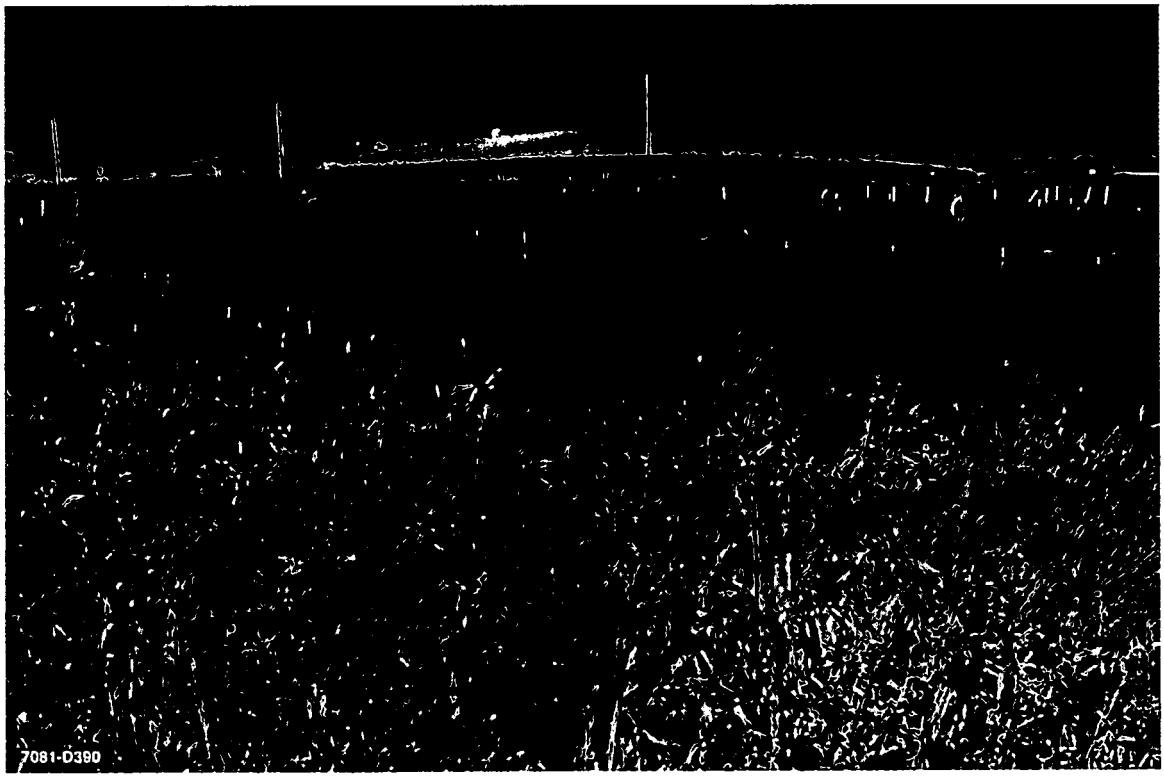

Photo #12: Basin 2 – View West

Photo #13: Basin 2 – View East

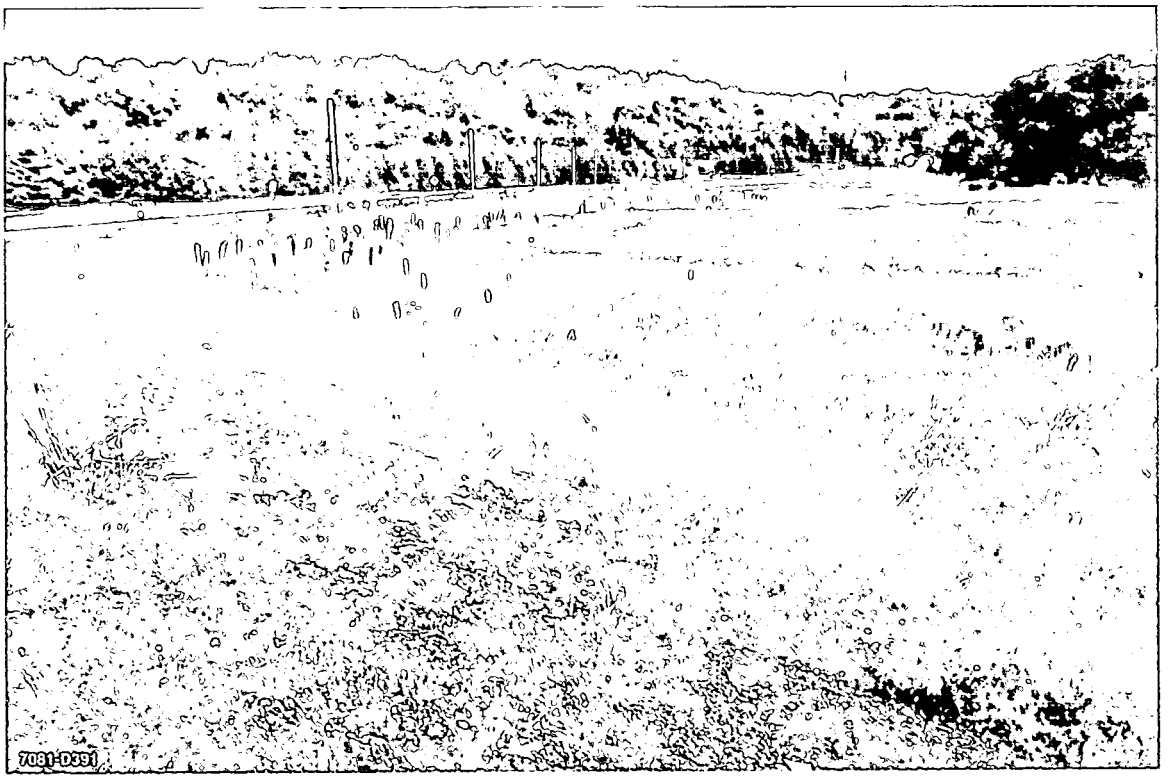

Photo #14: Basin 2 – View North

Photo #15: Basin 3 – View Southeast

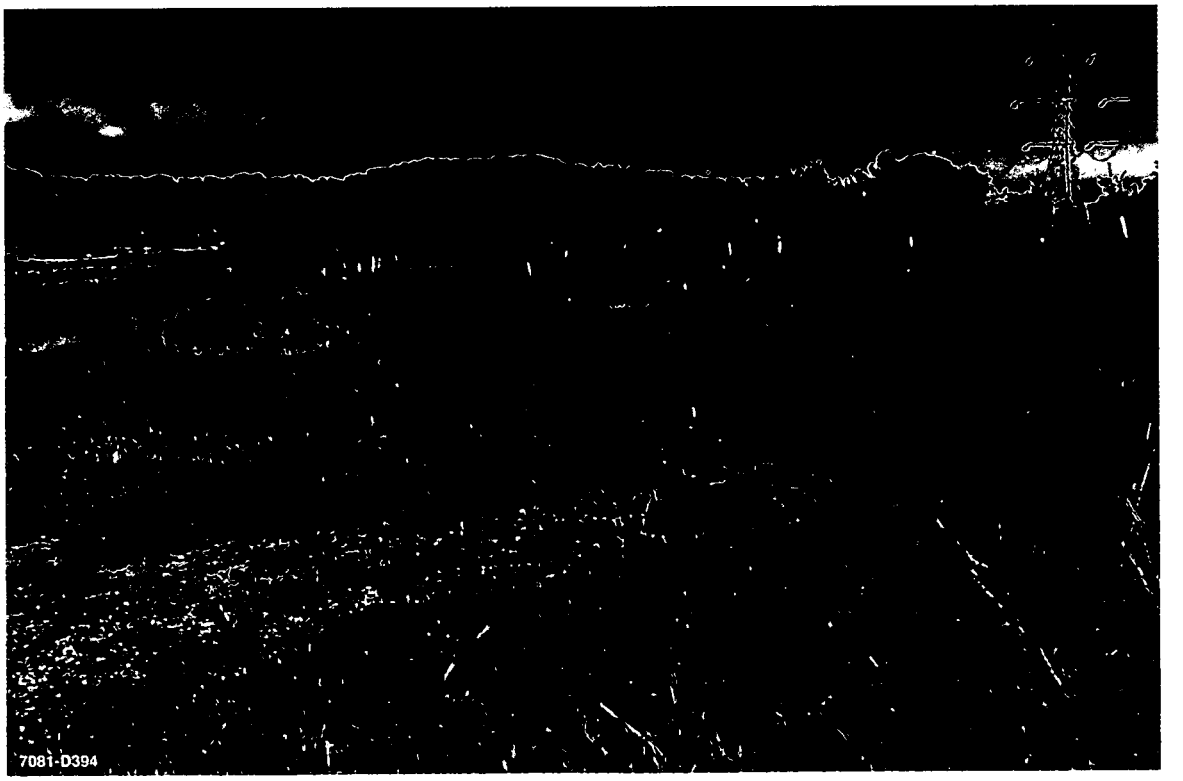

Photo #16: Basin 3 – View North

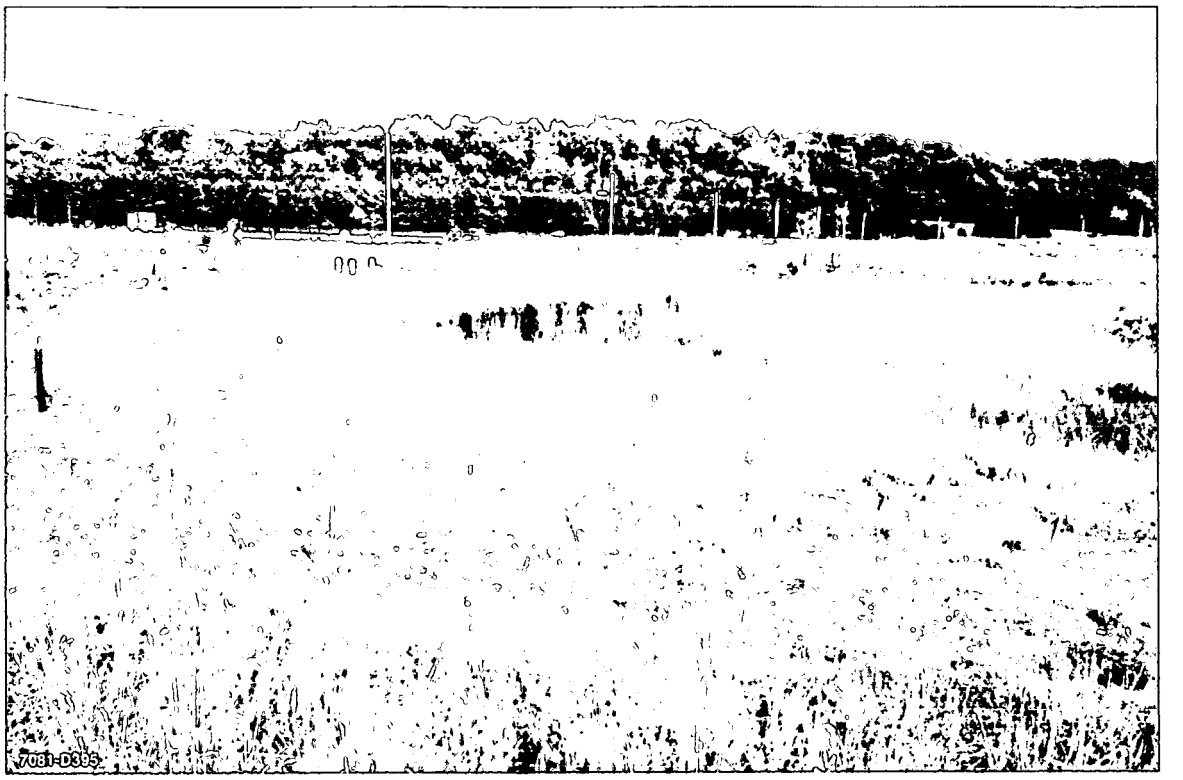

Photo #17: Basin 3 – View Northeast

Photo #18: Basin 4 – View Northeast

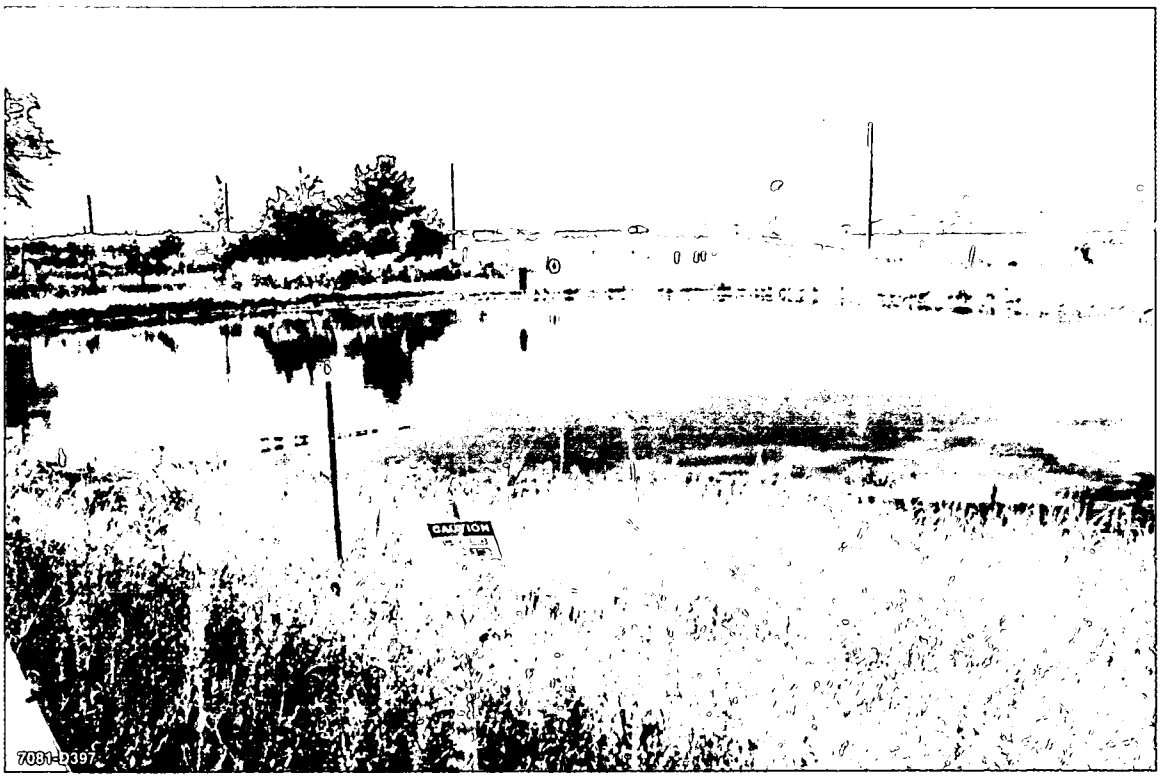

Photo #19: Basin 4 – View Southeast

Photo #20: Southern Extension of Basin 4 – View South

BASIN 1

3478

SECTION 2, UF7

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Acer saccharum			4	Juglans nigra		
	Aesculus glabra				Liriodendron tulipfera		
3	Aesculus octandra			4	Ostrya virginiana		
	Amelanchier arborea			4	Prunus americana		
8	Asimina triloba				Prunus serotina		
2	Ceanothus americanus			5	Quercus alba		
	Celtis occidentalis				Quercus coccinea		
	Cercis canadensis				Quercus imbricaria		
2	Cornus alternifolia				Quercus macrocarpa		
	Cornus florida			2	Quercus rubra		
	Diospyros virginiana				Quercus shumardii		
2	Fagus grandifolia			1	Quercus velutina		
	Fraxinus americana				Sassafras albidium		
	Gymnocladus dioica			1	Tilia americana		
	Juglans cinerea			3	Zanthoxylum americanum		

SECTION 2, UF8

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
2	Acer saccharum				Juglans nigra		
	Aesculus glabra			2	Liriodendron tulipfera		
	Aesculus octandra				Ostrya virginiana		
	Amelanchier arborea				Prunus americana		
	Asimina triloba			3	Prunus serotina		
	Ceanothus americanus				Quercus alba		
	Celtis occidentalis			2	Quercus coccinea		
4	Cercis canadensis				Quercus imbricaria		
	Cornus alternifolia			1	Quercus macrocarpa		
	Cornus florida				Quercus rubra		
2	Diospyros virginiana				Quercus shumardii		
4	Fagus grandifolia			1	Quercus velutina		
3	Fraxinus americana				Sassafras albidium		
	Gymnocladus dioica			2	Tilia americana		
	Juglans cinerea				Zanthoxylum americanum		

BASIN 1

SECTION 2, US15

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
2	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus			3	Prunus virginiana		
	Cercis canadensis				Rhus typhina		
	Cornus alternifolia				Ribes americanum		
2	Cornus amomum				Rosa setigera (caroliniana)		
0	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
2	Crateagus mollis				Symphoricarpos orbiculatus		
2	Hamamelis virginiana			2	Viburnum acerifolium		
	Hydrangea arborescens				Viburnum prunifolium		
	Lindera benzoin						

SECTION 2, US16

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus			3	Prunus virginiana		
	Cercis canadensis				Rhus typhina		
2	Cornus alternifolia				Ribes americanum		
5	Cornus amomum				Rosa setigera (caroliniana)		
	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
3	Crateagus mollis				Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
3	Hydrangea arborescens			5	Viburnum prunifolium		
3	Lindera benzoin						

BASIN 1

3478

SECTION 2, US19

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans			2	Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus			3	Prunus virginiana		
	Cercis canadensis				Rhus typhina		
1	Cornus alternifolia				Ribes americanum		
3	Cornus amomum				Rosa setigera (caroliniana)		
0	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
3	Crateagus crusgalli			3	Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens				Viburnum prunifolium		
3	Lindera benzoin						

BASIN 3

3478

SECTION 2, UF9

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
6	Acer saccharum			5	Juglans nigra		
3	Aesculus glabra			5	Liriodendron tulipfera		
1	Aesculus octandra			2	Ostrya virginiana		
5	Amelanchier arborea			1	Prunus americana		
	Asimina triloba				Prunus serotina		
3	Ceanothus americanus			2	Quercus alba		
1	Celtis occidentalis				Quercus coccinea		
	Cercis canadensis			2	Quercus imbricaria		
2	Cornus alternifolia				Quercus macrocarpa		
1	Cornus florida				Quercus rubra		
	Diospyros virginiana			2	Quercus shumardii		
	Fagus grandifolia			2	Quercus velutina		
6	Fraxinus americana				Sassafras albidium		
	Gymnocladus dioica			3	Tilia americana		
	Juglans cinerea			4	Zanthoxylum americanum		

SECTION 2, US20

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Amelanchier laevis			3	Lonicera sempervirens		
2	Campsis radicans				Parthenocissus Quinquefolia		
2	Celastrus scandens				Physocarpus opulifolius		
4	Ceanothus americanus				Prunus virginiana		
4	Cercis canadensis			8	Rhus typhina		
	Cornus alternifolia				Ribes americanum		
	Cornus amomum			4	Rosa setigera (caroliniana)		
	Cornus racemosa			3	Rubus allegheniensis		
2	Corylus americana			3	Rubus occidentalis		
4	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis			6	Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens			6	Viburnum prunifolium		
	Lindera benzoin						

BASIN 3

SECTION 2, US21

Spec.	Species	Alive	Vitality
2	Amelanchier laevis		
	Campsis radicans		
1	Celastrus scandens		
	Ceanothus americanus		
2	Cercis canadensis		
	Cornus alternifolia		
	Cornus amomum		
	Cornus racemosa		
	Corylus americana		
	Crateagus crusgalli		
	Crateagus mollis		
1	Hamamelis virginiana		
	Hydrangea arborescens		
	Lindera benzoin		

Spec.	Species	Alive	Vitality
3	Lonicera sempervirens		
3	Parthenocissus Quinquefolia		
	Physocarpus opulifolius		
6	Prunus virginiana		
	Rhus typhina		
	Ribes americanum		
	Rosa setigera (caroliniana)		
3	Rubus allegheniensis		
3	Rubus occidentalis		
	Staphylea trifolia		
5	Symphoricarpos orbiculatus		
	Viburnum acerifolium		
4	Viburnum prunifolium		
6	Amporha fructicosa		

SECTION 2, US22

Spec.	Species	Alive	Vitality
2	Amelanchier laevis		
	Campsis radicans		
3	Celastrus scandens		
1	Ceanothus americanus		
	Cercis canadensis		
	Cornus alternifolia		
	Cornus amomum		
	Cornus racemosa		
3	Corylus americana		
	Crateagus crusgalli		
5	Crateagus mollis		
	Hamamelis virginiana		
	Hydrangea arborescens		
	Lindera benzoin		

Spec.	Species	Alive	Vitality
	Lonicera sempervirens		
4	Parthenocissus Quinquefolia		
	Physocarpus opulifolius		
	Prunus virginiana		
6	Rhus typhina		
	Ribes americanum		
5	Rosa setigera (caroliniana)		
3	Rubus allegheniensis		
3	Rubus occidentalis		
	Staphylea trifolia		
6	Symphoricarpos orbiculatus		
	Viburnum acerifolium		
6	Viburnum prunifolium		

BASIN 3

3478

SECTION 2, US23

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
2	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens			2	Physocarpus opulifolius		
	Ceanothus americanus			3	Prunus virginiana		
	Cercis canadensis				Rhus typhina		
2	Cornus alternifolia				Ribes americanum		
5	Cornus amomum				Rosa setigera (caroliniana)		
	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli			6	Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
	Hamamelis virginiana			3	Viburnum acerifolium		
3	Hydrangea arborescens				Viburnum prunifolium		
2	Lindera benzoin			3	Hibiscus moscheutos		

SECTION 2, US24

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis			2	Lonicera sempervirens		
2	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus				Prunus virginiana		
	Cercis canadensis				Rhus typhina		
2	Cornus alternifolia			1	Ribes americanum		
3	Cornus amomum				Rosa setigera (caroliniana)		
	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
2	Hydrangea arborescens			3	Viburnum prunifolium		
1	Lindera benzoin			3	Hibiscus muscheutos		

BASIN 3

SECTION 3, UF11

Spec.	Species	Alive	Vitality
3	Acer saccharum		
5	Aesculus glabra		
	Aesculus octandra		
	Amelanchier arborea		
7	Asimina triloba		
1	Ceanothus americanus		
	Celtis occidentalis		
	Cercis canadensis		
	Cornus alternifolia		
	Cornus florida		
	Diospyros virginiana		
5	Fagus grandifolia		
4	Fraxinus americana		
3	Gymnocladus dioica		
	Juglans cinerea		
5	Rhus glabra		

Spec.	Species	Alive	Vitality
3	Juglans nigra		
6	Liriodendron tulipfera		
2	Ostrya virginiana		
	Prunus americana		
	Prunus serotina		
	Quercus alba		
	Quercus coccinea		
	Quercus imbricaria		
3	Quercus macrocarpa		
5	Quercus rubra		
	Quercus shumardii		
1	Quercus velutina		
	Sassafras albidium		
3	Tilia americana		
	Zanthoxylum americanum		

SECTION 3, UF12

Spec.	Species	Alive	Vitality
4	Acer saccharum		
	Aesculus glabra		
3	Aesculus octandra		
5	Amelanchier arborea		
	Asimina triloba		
4	Ceanothus americanus		
	Celtis occidentalis		
3	Cercis canadensis		
	Cornus alternifolia		
	Cornus florida		
3	Diospyros virginiana		
1	Fagus grandifolia		
2	Fraxinus americana		
	Gymnocladus dioica		
	Juglans cinerea		

Spec.	Species	Alive	Vitality
4	Juglans nigra		
2	Liriodendron tulipfera		
1	Ostrya virginiana		
	Prunus americana		
	Prunus serotina		
	Quercus alba		
2	Quercus coccinea		
	Quercus imbricaria		
	Quercus macrocarpa		
	Quercus rubra		
3	Quercus shumardii		
	Quercus velutina		
1	Sassafras albidium		
1	Tilia americana		
	Zanthoxylum americanum		

BASIN 3

SECTION 3, US25

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
5	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
1	Ceanothus americanus			6	Prunus virginiana		
	Cercis canadensis				Rhus typhina		
	Cornus alternifolia				Ribes americanum		
4	Cornus amomum				Rosa setigera (caroliniana)		
6	Cornus racemosa				Rubus allegheniensis		
2	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
4	Hamamelis virginiana			3	Viburnum acerifolium		
	Hydrangea arborescens			5	Viburnum prunifolium		
6	Lindera benzoin						

SECTION 3, US26

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
1	Amelanchier laevis			3	Lonicera sempervirens		
3	Campsis radicans			3	Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus				Prunus virginiana		
	Cercis canadensis			6	Rhus typhina		
0	Cornus alternifolia				Ribes americanum		
	Cornus amomum			3	Rosa setigera (caroliniana)		
	Cornus racemosa			1	Rubus allegheniensis		
	Corylus americana			3	Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis			6	Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens				Viburnum prunifolium		
	Lindera benzoin						

BASIN 3

SECTION 3, US27

Spec.	Species	Alive	Vitality
4	Amelanchier laevis		
	Campsis radicans		
	Celastrus scandens		
	Ceanothus americanus		
2	Cercis canadensis		
	Cornus alternifolia		
6	Cornus amomum		
5	Cornus racemosa		
	Corylus americana		
1	Crateagus crusgalli		
	Crateagus mollis		
6	Hamamelis virginiana		
	Hydrangea arborescens		
4	Lindera benzoin		

Spec.	Species	Alive	Vitality
2	Lonicera sempervirens		
	Parthenocissus Quinquefolia		
	Physocarpus opulifolius		
5	Prunus virginiana		
	Rhus typhina		
	Ribes americanum		
	Rosa setigera (caroliniana)		
2	Rubus allegheniensis		
	Rubus occidentalis		
	Staphylea trifolia		
	Symphoricarpos orbiculatus		
	Viburnum acerifolium		
6	Viburnum prunifolium		
1	Rhus glabra		

SECTION 3, US28

Spec.	Species	Alive	Vitality
3	Amelanchier laevis		
	Campsis radicans		
	Celastrus scandens		
6	Ceanothus americanus		
	Cercis canadensis		
2	Cornus alternifolia		
5	Cornus amomum		
3	Cornus racemosa		
	Corylus americana		
	Crateagus crusgalli		
2	Crateagus mollis		
5	Hamamelis virginiana		
5	Hydrangea arborescens		
12	Lindera benzoin		

Spec.	Species	Alive	Vitality
	Lonicera sempervirens		
	Parthenocissus Quinquefolia		
6	Physocarpus opulifolius		
8	Prunus virginiana		
	Rhus typhina		
	Ribes americanum		
	Rosa setigera (caroliniana)		
	Rubus allegheniensis		
	Rubus occidentalis		
10	Staphylea trifolia		
	Symphoricarpos orbiculatus		
5	Viburnum acerifolium		
8	Viburnum prunifolium		

BASIN 4

3478

SECTION 3, UF10

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Acer saccharum				Juglans nigra		
	Aesculus glabra				Liriodendron tulipfera		
	Aesculus octandra				Ostrya virginiana		
	Amelanchier arborea				Prunus americana		
	Asimina triloba				Prunus serotina		
	Ceanothus americanus				Quercus alba		
	Celtis occidentalis				Quercus coccinea		
	Cercis canadensis				Quercus imbricaria		
	Cornus alternifolia				Quercus macrocarpa		
	Cornus florida				Quercus rubra		
	Diospyros virginiana			2	Quercus shumardii		
2	Fagus grandifolia				Quercus velutina		
1	Fraxinus americana				Sassafras albidium		
	Gymnocladus dioica			1	Tilia americana		
	Juglans cinerea				Zanthoxylum americanum		

SECTION 3, UF13

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Acer saccharum			1	Juglans nigra		
	Aesculus glabra			2	Liriodendron tulipfera		
	Aesculus octandra				Ostrya virginiana		
	Amelanchier arborea			2	Prunus americana		
	Asimina triloba				Prunus serotina		
	Ceanothus americanus			4	Quercus alba		
4	Celtis occidentalis				Quercus coccinea		
	Cercis canadensis			3	Quercus imbricaria		
	Cornus alternifolia				Quercus macrocarpa		
	Cornus florida			1	Quercus rubra		
3	Diospyros virginiana				Quercus shumardii		
	Fagus grandifolia				Quercus velutina		
5	Fraxinus americana			2	Sassafras albidium		
	Gymnocladus dioica			1	Tilia americana		
1	Juglans cinerea			2	Zanthoxylum americanum		

BASIN 4

SECTION 3, UF14

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
8	Acer saccharum				Juglans nigra		
	Aesculus glabra			5	Liriodendron tulipfera		
2	Aesculus octandra				Ostrya virginiana		
1	Amelanchier arborea				Prunus americana		
	Asimina triloba			1	Prunus serotina		
	Ceanothus americanus				Quercus alba		
2	Celtis occidentalis			1	Quercus coccinea		
5	Cercis canadensis				Quercus imbricaria		
	Cornus alternifolia			3	Quercus macrocarpa		
0	Cornus florida				Quercus rubra		
	Diospyros virginiana			2	Quercus shumardii		
3	Fagus grandifolia				Quercus velutina		
9	Fraxinus americana				Sassafras albidium		
2	Gymnocladus dioica				Tilia americana		
	Juglans cinerea				Zanthoxylum americanum		

SECTION 3, UF15

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
2	Acer saccharum			1	Juglans nigra		
	Aesculus glabra				Liriodendron tulipfera		
2	Aesculus octandra				Ostrya virginiana		
	Amelanchier arborea			1	Prunus americana		
6	Asimina triloba				Prunus serotina		
	Ceanothus americanus				Quercus alba		
	Celtis occidentalis				Quercus coccinea		
	Cercis canadensis			3	Quercus imbricaria		
	Cornus alternifolia				Quercus macrocarpa		
	Cornus florida				Quercus rubra		
	Diospyros virginiana				Quercus shumardii		
	Fagus grandifolia			3	Quercus velutina		
2	Fraxinus americana				Sassafras albidium		
	Gymnocladus dioica				Tilia americana		
	Juglans cinerea				Zanthoxylum americanum		

BASIN 4

3478

SECTION 3, UF16

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Acer saccharum				Juglans nigra		
	Aesculus glabra				Liriodendron tulipfera		
	Aesculus octandra				Ostrya virginiana		
	Amelanchier arborea				Prunus americana		
	Asimina triloba				Prunus serotina		
	Ceanothus americanus				Quercus alba		
	Celtis occidentalis				Quercus coccinea		
	Cercis canadensis				Quercus imbricaria		
	Cornus alternifolia				Quercus macrocarpa		
	Cornus florida			3	Quercus rubra		
2	Diospyros virginiana				Quercus shumardii		
	Fagus grandifolia				Quercus velutina		
	Fraxinus americana				Sassafras albidium		
	Gymnocladus dioica				Tilia americana		
	Juglans cinerea				Zanthoxylum americanum		

SECTION 3, US29

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis			3	Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus				Prunus virginiana		
	Cercis canadensis			3	Rhus typhina		
1	Cornus alternifolia				Ribes americanum		
	Cornus amomum			3	Rosa setigera (caroliniana)		
	Cornus racemosa				Rubus allegheniensis		
	Corylus americana			3	Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens			6	Viburnum prunifolium		
	Lindera benzoin						

BASIN 4

SECTION 3, US30

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens			6	Physocarpus opulifolius		
	Ceanothus americanus			2	Prunus virginiana		
	Cercis canadensis				Rhus typhina		
	Cornus alternifolia			1	Ribes americanum		
4	Cornus amomum				Rosa setigera (caroliniana)		
6	Cornus racemosa				Rubus allegheniensis		
1	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli			9	Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
4	Hamamelis virginiana			1	Viburnum acerifolium		
	Hydrangea arborescens			3	Viburnum prunifolium		
6	Lindera benzoin						

SECTION 3, US31

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans			2	Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus			5	Prunus virginiana		
	Cercis canadensis				Rhus typhina		
	Cornus alternifolia				Ribes americanum		
5	Cornus amomum				Rosa setigera (caroliniana)		
5	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
5	Hamamelis virginiana			4	Viburnum acerifolium		
	Hydrangea arborescens				Viburnum prunifolium		
7	Lindera benzoin						

BASIN 4

SECTION 3, US32

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Amelanchier laevis				Lonicera sempervirens		
3	Campsis radicans			4	Parthenocissus Quinquefolia		
3	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus				Prunus virginiana		
	Cercis canadensis			4	Rhus typhina		
	Cornus alternifolia				Ribes americanum		
	Cornus amomum			4	Rosa setigera (caroliniana)		
	Cornus racemosa			3	Rubus allegheniensis		
	Corylus americana			2	Rubus occidentalis		
3	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis			4	Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens			5	Viburnum prunifolium		
	Lindera benzoin						

SECTION 3, US33

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus			3	Prunus virginiana		
4	Cercis canadensis				Rhus typhina		
	Cornus alternifolia				Ribes americanum		
3	Cornus amomum				Rosa setigera (caroliniana)		
3	Cornus racemosa				Rubus allegheniensis		
3	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
4	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens				Viburnum prunifolium		
3	Lindera benzoin						

BASIN 5

SECTION 2, UF5

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Acer saccharum				Juglans nigra		
	Aesculus glabra			3	Liriodendron tulipfera		
	Aesculus octandra				Ostrya virginiana		
	Amelanchier arborea				Prunus americana		
	Asimina triloba			3	Prunus serotina		
	Ceanothus americanus				Quercus alba		
	Celtis occidentalis			2	Quercus coccinea		
2	Cercis canadensis				Quercus imbricaria		
	Cornus alternifolia			1	Quercus macrocarpa		
	Cornus florida			1	Quercus rubra		
	Diospyros virginiana				Quercus shumardii		
2	Fagus grandifolia				Quercus velutina		
3	Fraxinus americana				Sassafras albidium		
1	Gymnocladus dioica				Tilia americana		
	Juglans cinerea				Zanthoxylum americanum		

SECTION 2, UF6

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
1	Acer saccharum			1	Juglans nigra		
3	Aesculus glabra			1	Liriodendron tulipfera		
	Aesculus octandra				Ostrya virginiana		
	Amelanchier arborea				Prunus americana		
	Asimina triloba				Prunus serotina		
	Ceanothus americanus				Quercus alba		
3	Celtis occidentalis				Quercus coccinea		
	Cercis canadensis			2	Quercus imbricaria		
	Cornus alternifolia				Quercus macrocarpa		
	Cornus florida			1	Quercus rubra		
2	Diospyros virginiana			2	Quercus shumardii		
	Fagus grandifolia			1	Quercus velutina		
2	Fraxinus americana				Sassafras albidium		
	Gymnocladus dioica			3	Tilia americana		
	Juglans cinerea				Zanthoxylum americanum		

BASIN 5

SECTION 2, US17

Spec.	Species	Alive	Vitality
3	Amelanchier laevis		
	Campsis radicans		
	Celastrus scandens		
	Ceanothus americanus		
2	Cercis canadensis		
4	Cornus alternifolia		
3	Cornus amomum		
	Cornus racemosa		
5	Corylus americana		
	Crateagus crusgalli		
	Crateagus mollis		
1	Hamamelis virginiana		
3	Hydrangea arborescens		
5	Lindera benzoin		

Spec.	Species	Alive	Vitality
	Lonicera sempervirens		
	Parthenocissus Quinquefolia		
7	Physocarpus opulifolius		
4	Prunus virginiana		
	Rhus typhina		
	Ribes americanum		
	Rosa setigera (caroliniana)		
	Rubus allegheniensis		
	Rubus occidentalis		
9	Staphylea trifolia		
	Symphoricarpos orbiculatus		
	Viburnum acerifolium		
4	Viburnum prunifolium		

SECTION 2, US18

Spec.	Species	Alive	Vitality
5	Amelanchier laevis		
1	Campsis radicans		
	Celastrus scandens		
3	Ceanothus americanus		
	Cercis canadensis		
3	Cornus alternifolia		
5	Cornus amomum		
	Cornus racemosa		
4	Corylus americana		
	Crateagus crusgalli		
6	Crateagus mollis		
	Hamamelis virginiana		
3	Hydrangea arborescens		
11	Lindera benzoin		

Spec.	Species	Alive	Vitality
	Lonicera sempervirens		
	Parthenocissus Quinquefolia		
3	Physocarpus opulifolius		
8	Prunus virginiana		
	Rhus typhina		
	Ribes americanum		
3	Rosa setigera (caroliniana)		
	Rubus allegheniensis		
	Rubus occidentalis		
	Staphylea trifolia		
	Symphoricarpos orbiculatus		
	Viburnum acerifolium		
6	Viburnum prunifolium		

BASIN 6

3478

SECTION 1, UF2

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
2	Acer saccharum				Juglans nigra		
2	Aesculus glabra				Liriodendron tulipfera		
	Aesculus octandra				Ostrya virginiana		
	Amelanchier arborea				Prunus americana		
	Asimina triloba				Prunus serotina		
	Ceanothus americanus				Quercus alba		
	Celtis occidentalis			2	Quercus coccinea		
	Cercis canadensis				Quercus imbricaria		
	Cornus alternifolia				Quercus macrocarpa		
1	Cornus florida				Quercus rubra		
	Diospyros virginiana				Quercus shumardii		
	Fagus grandifolia				Quercus velutina		
3	Fraxinus americana				Sassafras albidium		
	Gymnocladus dioica				Tilia americana		
	Juglans cinerea				Zanthoxylum americanum		

SECTION 1, UF3

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
4	Acer saccharum			3	Juglans nigra		
	Aesculus glabra			4	Liriodendron tulipfera		
3	Aesculus octandra			2	Ostrya virginiana		
	Amelanchier arborea				Prunus americana		
	Asimina triloba				Prunus serotina		
	Ceanothus americanus			2	Quercus alba		
	Celtis occidentalis				Quercus coccinea		
	Cercis canadensis			2	Quercus imbricaria		
	Cornus alternifolia				Quercus macrocarpa		
	Cornus florida				Quercus rubra		
	Diospyros virginiana			1	Quercus shumardii		
	Fagus grandifolia				Quercus velutina		
	Fraxinus americana				Sassafras albidium		
2	Gymnocladus dioica				Tilia americana		
1	Fraxinus nigra				Zanthoxylum americanum		

BASIN 6

SECTION 1, UF4

Spec.	Species	Alive	Vitality
2	Acer saccharum		
	Aesculus glabra		
	Aesculus octandra		
	Amelanchier arborea		
6	Asimina triloba		
	Ceanothus americanus		
	Celtis occidentalis		
	Cercis canadensis		
	Cornus alternifolia		
	Cornus florida		
	Diospyros virginiana		
	Fagus grandifolia		
3	Fraxinus americana		
	Gymnocladus dioica		
	Juglans cinerea		

Spec.	Species	Alive	Vitality
	Juglans nigra		
2	Liriodendron tulipfera		
	Ostrya virginiana		
	Prunus americana		
	Prunus serotina		
	Quercus alba		
	Quercus coccinea		
	Quercus imbricaria		
	Quercus macrocarpa		
2	Quercus rubra		
	Quercus shumardii		
	Quercus velutina		
1	Sassafras albidium		
	Tilia americana		
	Zanthoxylum americanum		

SECTION 1, US3

Spec.	Species	Alive	Vitality
7	Amelanchier laevis		
3	Campsis radicans		
1	Celastrus scandens		
	Ceanothus americanus		
1	Cercis canadensis		
3	Cornus alternifolia		
9	Cornus amomum		
5	Cornus racemosa		
	Corylus americana		
	Crateagus crusgalli		
	Crateagus mollis		
	Hamamelis virginiana		
	Hydrangea arborescens		
2	Lindera benzoin		

Spec.	Species	Alive	Vitality
	Lonicera sempervirens		
4	Parthenocissus Quinquefolia		
	Physocarpus opulifolius		
2	Prunus virginiana		
	Rhus typhina		
	Ribes americanum		
4	Rosa setigera (caroliniana)		
4	Rubus allegheniensis		
4	Rubus occidentalis		
	Staphylea trifolia		
4	Symphoricarpos orbiculatus		
	Viburnum acerifolium		
11	Viburnum prunifolium		

BASIN 6

3478

SECTION 1, US5

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens			3	Physocarpus opulifolius		
	Ceanothus americanus			2	Prunus virginiana		
	Cercis canadensis				Rhus typhina		
1	Cornus alternifolia			2	Ribes americanum		
3	Cornus amomum				Rosa setigera (caroliniana)		
	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli			2	Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens			3	Viburnum prunifolium		
	Lindera benzoin						

SECTION 1, US9

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus				Prunus virginiana		
	Cercis canadensis				Rhus typhina		
	Cornus alternifolia				Ribes americanum		
	Cornus amomum				Rosa setigera (caroliniana)		
	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli			3	Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
	Hamamelis virginiana			3	Viburnum acerifolium		
	Hydrangea arborescens				Viburnum prunifolium		
	Lindera benzoin						

BASIN 6

SECTION 1, US13

Spec.	Species	Alive	Vitality
3	Amelanchier laevis		
	Campsis radicans		
	Celastrus scandens		
	Ceanothus americanus		
	Cercis canadensis		
2	Cornus alternifolia		
2	Cornus amomum		
3	Cornus racemosa		
5	Corylus americana		
	Crateagus crusgalli		
	Crateagus mollis		
4	Hamamelis virginiana		
	Hydrangea arborescens		
5	Lindera benzoin		

Spec.	Species	Alive	Vitality
	Lonicera sempervirens		
3	Parthenocissus Quinquefolia		
2	Physocarpus opulifolius		
4	Prunus virginiana		
	Rhus typhina		
	Ribes americanum		
	Rosa setigera (caroliniana)		
	Rubus allegheniensis		
	Rubus occidentalis		
3	Staphylea trifolia		
	Symphoricarpos orbiculatus		
	Viburnum acerifolium		
2	Viburnum prunifolium		

SECTION 1, US14

Spec.	Species	Alive	Vitality
1	Amelanchier laevis		
	Campsis radicans		
3	Celastrus scandens		
	Ceanothus americanus		
5	Cercis canadensis		
	Cornus alternifolia		
	Cornus amomum		
4	Cornus racemosa		
3	Corylus americana		
1	Crateagus crusgalli		
	Crateagus mollis		
	Hamamelis virginiana		
	Hydrangea arborescens		
	Lindera benzoin		

Spec.	Species	Alive	Vitality
3	Lonicera sempervirens		
3	Parthenocissus Quinquefolia		
	Physocarpus opulifolius		
	Prunus virginiana		
	Rhus typhina		
	Ribes americanum		
	Rosa setigera (caroliniana)		
	Rubus allegheniensis		
	Rubus occidentalis		
	Staphylea trifolia		
3	Symphoricarpos orbiculatus		
	Viburnum acerifolium		
3	Viburnum prunifolium		

BASIN 7

3478

SECTION 1, US2

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis			2	Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus				Prunus virginiana		
	Cercis canadensis				Rhus typhina		
	Cornus alternifolia				Ribes americanum		
2	Cornus amomum				Rosa setigera (caroliniana)		
4	Cornus racemosa				Rubus allegheniensis		
	Corylus americana			2	Rubus occidentalis		
1	Crateagus crusgalli				Staphylea trifolia		
2	Crateagus mollis			3	Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens			2	Viburnum prunifolium		
	Lindera benzoin						

SECTION 1, US4

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
1	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens			1	Physocarpus opulifolius		
	Ceanothus americanus			2	Prunus virginiana		
	Cercis canadensis				Rhus typhina		
	Cornus alternifolia			2	Ribes americanum		
3	Cornus amomum				Rosa setigera (caroliniana)		
2	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
1	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens				Viburnum prunifolium		
	Lindera benzoin						

BASIN 7

SECTION 1, US8

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus			2	Prunus virginiana		
	Cercis canadensis				Rhus typhina		
3	Cornus alternifolia				Ribes americanum		
5	Cornus amomum				Rosa setigera (caroliniana)		
2	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis			3	Symphoricarpos orbiculatus		
2	Hamamelis virginiana			1	Viburnum acerifolium		
	Hydrangea arborescens			1	Viburnum prunifolium		
3	Lindera benzoin			8	Rhus glabra		

SECTION 1, US10

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens			1	Physocarpus opulifolius		
	Ceanothus americanus				Prunus virginiana		
	Cercis canadensis				Rhus typhina		
2	Cornus alternifolia				Ribes americanum		
	Cornus amomum				Rosa setigera (caroliniana)		
	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
	Hamamelis virginiana			1	Viburnum acerifolium		
	Hydrangea arborescens				Viburnum prunifolium		
	Lindera benzoin						

BASIN 7

3478

SECTION 1, US11

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
2	Amelanchier laevis				Lonicera sempervirens		
3	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens			5	Physocarpus opulifolius		
	Ceanothus americanus			5	Prunus virginiana		
	Cercis canadensis			4	Rhus typhina		
1	Cornus alternifolia			5	Ribes americanum		
7	Cornus amomum				Rosa setigera (caroliniana)		
6	Cornus racemosa				Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
	Crateagus crusgalli			4	Staphylea trifolia		
4	Crateagus mollis				Symphoricarpos orbiculatus		
5	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens			6	Viburnum prunifolium		
3	Lindera benzoin						

BASIN 8

3478

SECTION 1, UF1

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
1	Acer saccharum				Juglans nigra		
	Aesculus glabra				Liriodendron tulipfera		
	Aesculus octandra				Ostrya virginiana		
1	Amelanchier arborea				Prunus americana		
	Asimina triloba				Prunus serotina		
	Ceanothus americanus			2	Quercus alba		
	Celtis occidentalis				Quercus coccinea		
	Cercis canadensis				Quercus imbricaria		
	Cornus alternifolia				Quercus macrocarpa		
	Cornus florida				Quercus rubra		
1	Diospyros virginiana			1	Quercus shumardii		
2	Fagus grandifolia				Quercus velutina		
3	Fraxinus americana				Sassafras albidium		
	Gymnocladus dioica				Tilia americana		
	Juglans cinerea				Zanthoxylum americanum		

SECTION 1, US1

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans				Parthenocissus Quinquefolia		
1	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus				Prunus virginiana		
	Cercis canadensis				Rhus typhina		
	Cornus alternifolia				Ribes americanum		
	Cornus amomum				Rosa setigera (caroliniana)		
	Cornus racemosa			3	Rubus allegheniensis		
	Corylus americana				Rubus occidentalis		
1	Crateagus crusgalli				Staphylea trifolia		
2	Crateagus mollis				Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens			3	Viburnum prunifolium		
	Lindera benzoin						

BASIN 8

SECTION 1, US6

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis				Lonicera sempervirens		
	Campsis radicans			2	Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
	Ceanothus americanus				Prunus virginiana		
	Cercis canadensis			2	Rhus typhina		
	Cornus alternifolia				Ribes americanum		
	Cornus amomum				Rosa setigera (caroliniana)		
	Cornus racemosa				Rubus allegheniensis		
	Corylus americana			2	Rubus occidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis			3	Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens				Viburnum prunifolium		
	Lindera benzoin						

SECTION 1, US7

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Amelanchier laevis			3	Lonicera sempervirens		
2	Campsis radicans				Parthenocissus Quinquefolia		
	Celastrus scandens				Physocarpus opulifolius		
3	Ceanothus americanus				Prunus virginiana		
	Cercis canadensis			4	Rhus typhina		
	Cornus alternifolia				Ribes americanum		
2	Cornus amomum				Rosa setigera (caroliniana)		
	Cornus racemosa			2	Rubus allegheniensis		
	Corylus americana				Rubus o*ccidentalis		
	Crateagus crusgalli				Staphylea trifolia		
	Crateagus mollis				Symphoricarpos orbiculatus		
	Hamamelis virginiana				Viburnum acerifolium		
	Hydrangea arborescens			3	Viburnum prunifolium		
	Lindera benzoin			8	Rhus glabra		

BASIN 1

3478

SECTION 2, WF6

Spec	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
2	Acer rubrum				Platanus occidentalis		
	Acer saccharinum				Quercus bicolor		
	Carpinus caroliniana			3	Quercus palustris		
1	Fraxinus nigra			3	Salix eriocephala		
2	Fraxinus pennsylvanica				Salix nigra		
	Liquidambar styraciflua			2	Ulmus americana		
3	Nyssa sylvatica						
1	Liriodendron tulipifera						

SECTION 2, WS8

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa				Salix discolor		
14	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
					Viburnum Dentatum		

SECTION 2, WS9

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
9	Alnus serrulata			12	Rosa palustris		
8	Aronia melanocarpa			4	Salix discolor		
11	Cephalanthus occidentalis			6	Salix exigua		
8	Cornus amomum			6	Salix sericea		
	Decondon verticillatus			10	Sambucus canadensis		
5	Hypericum prolificum			14	Spiraea alba		
9	Ilex verticillata			13	Spiraea tomentosa		
5	Ribes americanum				Ulmus rubra		
				15	Viburnum Dentatum		

BASIN 1

SECTION 2, WS10

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
6	Alnus serrulata			6	Rosa palustris		
5	Aronia melanocarpa			5	Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum			3	Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum			6	Spiraea alba		
3	Ilex verticillata			6	Spiraea tomentosa		
	Ribes americanum			1	Ulmus rubra		
				6	Viburnum Dentatum		

SECTION 2, WS11

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata			14	Rosa palustris		
	Aronia melanocarpa				Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
					Viburnum Dentatum		

SECTION 2, WS12

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa				Salix discolor		
27	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		

SECTION 2, WF7

Spec	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
6	Acer rubrum			2	Platanus occidentalis		
3	Acer saccharinum			3	Quercus bicolor		
	Carpinus caroliniana			6	Quercus palustris		
	Fraxinus nigra				Salix eriocephala		
4	Fraxinus pennsylvanica				Salix nigra		
3	Liquidambar styraciflua			4	Ulmus americana		
2	Nyssa sylvatica						

SECTION 2, WF8

Spec	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
2	Acer rubrum			2	Platanus occidentalis		
	Acer saccharinum			3	Quercus bicolor		
2	Carpinus caroliniana			5	Quercus palustris		
3	Fraxinus nigra			4	Salix eriocephala		
3	Fraxinus pennsylvanica			3	Salix nigra		
	Liquidambar styraciflua			1	Ulmus americana		
	Nyssa sylvatica						

SECTION 2, WF9

Spec	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
4	Acer rubrum				Platanus occidentalis		
2	Acer saccharinum			5	Quercus bicolor		
3	Carpinus caroliniana				Quercus palustris		
	Fraxinus nigra				Salix eriocephala		
4	Fraxinus pennsylvanica			6	Salix nigra		
2	Liquidambar styraciflua			3	Ulmus americana		
4	Nyssa sylvatica						

BASIN 2

SECTION 2, WS15

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata			4	Rosa palustris		
7	Aronia melanocarpa				Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum			5	Salix sericea		
5	Decondon verticillatus			4	Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
					Viburnum Dentatum		

SECTION 2, WS16

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa				Salix discolor		
41	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		

SECTION 2, WS17

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
10	Alnus serrulata			7	Rosa palustris		
9	Aronia melanocarpa			5	Salix discolor		
12	Cephalanthus occidentalis			7	Salix exigua		
10	Cornus amomum				Salix sericea		
10	Decondon verticillatus			11	Sambucus canadensis		
6	Hypericum prolificum			12	Spiraea alba		
9	Ilex verticillata			5	Spiraea tomentosa		
1	Ribes americanum			3	Ulmus rubra		
				3	Viburnum Dentatum		

BASIN 3

SECTION 3, WF10

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
6	Acer rubrum			3	Platanus occidentalis		
6	Acer saccharinum			6	Quercus bicolor		
6	Carpinus caroliniana			8	Quercus palustris		
2	Fraxinus nigra				Salix eriocephala		
6	Fraxinus pennsylvanica			2	Salix nigra		
7	Liquidambar styraciflua			2	Ulmus americana		
5	Nyssa sylvatica						

SECTION 3, WS18

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
8	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa				Salix discolor		
3	Cephalanthus occidentalis			2	Salix exigua		
5	Cornus amomum				Salix sericea		
	Decondon verticillatus			5	Sambucus canadensis		
	Hypericum prolificum			6	Spiraea alba		
6	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum			3	Ulmus rubra		
					Viburnum Dentatum		

SECTION 3, WS19

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
4	Alnus serrulata				Rosa palustris		
8	Aronia melanocarpa			4	Salix discolor		
35	Cephalanthus occidentalis				Salix exigua		
8	Cornus amomum				Salix sericea		
	Decondon verticillatus			9	Sambucus canadensis		
	Hypericum prolificum			9	Spiraea alba		
6	Ilex verticillata				Spiraea tomentosa		
1	Ribes americanum			3	Ulmus rubra		
5	Rhus glabra			12	Viburnum Dentatum		

BASIN 3

SECTION 3, WS20

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
4	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa			4	Salix discolor		
	Cephalanthus occidentalis			5	Salix exigua		
5	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
1	Hypericum prolificum				Spiraea alba		
5	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
					Viburnum Dentatum		

SECTION 3, WS21

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa				Salix discolor		
27	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		

SECTION 3, WS22

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata			14	Rosa palustris		
	Aronia melanocarpa				Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
					Viburnum Dentatum		

BASIN 4

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SECTION 3, WS23

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata			8	Rosa palustris		
5	Aronia melanocarpa			8	Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
3	Cornus amomum				Salix sericea		
	Decondon verticillatus			6	Sambucus canadensis		
	Hypericum prolificum			3	Spiraea alba		
6	Ilex verticillata				Spiraea tomentosa		
4	Ribes americanum				Ulmus rubra		
				12	Viburnum Dentatum		

SECTION 3, WS24

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata				Rosa palustris		
6	Aronia melanocarpa			6	Salix discolor		
5	Cephalanthus occidentalis			6	Salix exigua		
6	Cornus amomum				Salix sericea		
1	Decondon verticillatus			6	Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
6	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
				9	Viburnum Dentatum		

SECTION 3, WS25

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa			7	Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
6	Cornus amomum			2	Salix sericea		
	Decondon verticillatus			9	Sambucus canadensis		
	Hypericum prolificum			4	Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		

BASIN 4

SECTION 3, WS26

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa				Salix discolor		
26	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
					Viburnum Dentatum		

SECTION 3, WS27

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Alnus serrulata			6	Rosa palustris		
	Aronia melanocarpa				Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
6	Cornus amomum				Salix sericea		
	Decondon verticillatus			7	Sambucus canadensis		
4	Hypericum prolificum				Spiraea alba		
6	Ilex verticillata			3	Spiraea tomentosa		
1	Ribes americanum			1	Ulmus rubra		
				6	Viburnum Dentatum		

BASIN 5

SECTION 2, W13

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
5	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa			3	Salix discolor		
	Cephalanthus occidentalis			3	Salix exigua		
3	Cornus amomum				Salix sericea		
	Decondon verticillatus			6	Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
6	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum			4	Ulmus rubra		
				7	Viburnum Dentatum		

SECTION 2, WS14

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
4	Alnus serrulata			4	Rosa palustris		
	Aronia melanocarpa			3	Salix discolor		
	Cephalanthus occidentalis			2	Salix exigua		
5	Cornus amomum				Salix sericea		
	Decondon verticillatus			1	Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
3	Ilex verticillata			4	Spiraea tomentosa		
	Ribes americanum			4	Ulmus rubra		
				3	Viburnum Dentatum		

BASIN 6

SECTION 1, WF3

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
7	Acer rubrum				Platanus occidentalis		
3	Acer saccharinum				Quercus bicolor		
3	Carpinus caroliniana			7	Quercus palustris		
3	Fraxinus nigra				Salix eriocephala		
3	Fraxinus pennsylvanica				Salix nigra		
	Liquidambar styraciflua			3	Ulmus americana		
	Nyssa sylvatica						

SECTION 1, WF4

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
6	Acer rubrum				Platanus occidentalis		
	Acer saccharinum			6	Quercus bicolor		
3	Carpinus caroliniana			3	Quercus palustris		
1	Fraxinus nigra				Salix eriocephala		
4	Fraxinus pennsylvanica			2	Salix nigra		
3	Liquidambar styraciflua				Ulmus americana		
2	Nyssa sylvatica						

SECTION 1, WF5

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
4	Acer rubrum			3	Platanus occidentalis		
5	Acer saccharinum			3	Quercus bicolor		
	Carpinus caroliniana			5	Quercus palustris		
	Fraxinus nigra				Salix eriocephala		
3	Fraxinus pennsylvanica				Salix nigra		
	Liquidambar styraciflua				Ulmus americana		
4	Nyssa sylvatica						

BASIN 6

SECTION 1, WS4

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Alnus serrulata				Rosa palustris		
3	Aronia melanocarpa			3	Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
2	Cornus amomum				Salix sericea		
	Decondon verticillatus			5	Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
3	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
6	Rhus glabra			4	Viburnum Dentatum		

SECTION 1, WS5

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa				Salix discolor		
53	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
					Viburnum Dentatum		

SECTION 1, WS6

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata			27	Rosa palustris		
	Aronia melanocarpa				Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		

BASIN 6

SECTION 1, WS7

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Alnus serrulata				Rosa palustris		
	Aronia melanocarpa			3	Salix discolor		
2	Cephalanthus occidentalis				Salix exigua		
2	Cornus amomum				Salix sericea		
	Decondon verticillatus			4	Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
3	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum			2	Ulmus rubra		
				5	Viburnum Dentatum		

BASIN 7

3478

SECTION 1, WF1

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Acer rubrum				Platanus occidentalis		
1	Acer saccharinum			3	Quercus bicolor		
	Carpinus caroliniana			4	Quercus palustris		
	Fraxinus nigra				Salix eriocephala		
3	Fraxinus pennsylvanica				Salix nigra		
	Liquidambar styraciflua			3	Ulmus americana		
2	Nyssa sylvatica						

SECTION 1, WF2

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Acer rubrum			3	Platanus occidentalis		
	Acer saccharinum				Quercus bicolor		
	Carpinus caroliniana			3	Quercus palustris		
	Fraxinus nigra				Salix eriocephala		
4	Fraxinus pennsylvanica			1	Salix nigra		
	Liquidambar styraciflua				Ulmus americana		
	Nyssa sylvatica						

SECTION 1, WS2

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
5	Alnus serrulata				Rosa palustris		
3	Aronia melanocarpa				Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
3	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum			6	Spiraea alba		
5	Ilex verticillata			5	Spiraea tomentosa		
2	Ribes americanum			5	Ulmus rubra		
					Viburnum Dentatum		

BASIN 7

SECTION 1, WS3

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
	Alnus serrulata			27	Rosa palustris		
	Aronia melanocarpa				Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
	Cornus amomum				Salix sericea		
	Decondon verticillatus				Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
					Viburnum Dentatum		

BASIN 8

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SECTION 1, WS1

Spec.	Species	Alive	Vitality	Spec.	Species	Alive	Vitality
3	Alnus serrulata				Rosa palustris		
3	Aronia melanocarpa			2	Salix discolor		
	Cephalanthus occidentalis				Salix exigua		
1	Cornus amomum				Salix sericea		
	Decondon verticillatus			4	Sambucus canadensis		
	Hypericum prolificum				Spiraea alba		
5	Ilex verticillata				Spiraea tomentosa		
	Ribes americanum				Ulmus rubra		
				5	Viburnum Dentatum		

APPENDIX B

WOODY PLANT SPECIES SURVIVAL COUNTS

APPENDIX B
WOODY PLANT SPECIES SURVIVAL COUNTS

Section 1

Patch	No. Planted	No. Dead	% Survival	No. Plants to be Installed Fall 2000
UF1	9	3	67%	5
UF2	36	26	28%	0
UF3	19	11	42%	16
UF4	14	2	86%	5
US1	14	1	93%	0
US2	35	17	51%	0
US3	116	51	56%	0
US4	15	2	87%	0
US5	27	11	59%	0
US6	10	1	90%	0
US7	20	10	50%	13
US8	25	11	56%	9
US9	14	8	43%	0
US10	14	10	29%	0
US11	63	26	59%	32
US12	44	14	68%	0
US13	43	22	49%	20
US14	40	22	45%	20
WF1	19	10	47%	10
WF2	17	7	59%	4
WF3	25	15	40%	20
WF4	32	10	69%	8
WF5	27	10	63%	10
WS1	24	8	67%	8
WS2	21	3	86%	16
WS3	27	0	100%	0
WS4	26	15	42%	12
WS5	54	1	98%	0
WS6	27	0	100%	0
WS7	25	18	28%	16
Totals	**882**	**345**	**61%**	**224**

APPENDIX B
WOODY PLANT SPECIES SURVIVAL COUNTS

Section 2

Patch	No. Planted	No. Dead	% Survival	No. Plants to be Installed Fall 2000
UF5	27	11	59%	5
UF6	26	4	85%	0
UF7	56	15	73%	3
UF8	39	11	72%	0
UF9	79	23	71%	0
US15	16	3	81%	0
US16	26	2	92%	0
US17	63	19	70%	12
US18	59	15	75%	25
US19	21	2	90%	0
US20	65	11	83%	0
US21	52	13	75%	0
US22	53	6	89%	0
US23	37	6	84%	0
US24	23	4	83%	0
WF6	23	6	74%	0
WF7	35	9	74%	7
WF8	31	3	90%	0
WF9	39	11	72%	5
WS8	14	0	100%	0
WS9	162	44	73%	20
WS10	54	19	65%	11
WS11	14	0	100%	0
WS12	27	0	100%	0
WS13	35	18	49%	18
WS14	39	20	49%	16
WS15	27	2	93%	0
WS16	41	0	100%	0
WS17	147	47	68%	27
Totals	**1330**	**324**	**76%**	**149**

APPENDIX B
WOODY PLANT SPECIES SURVIVAL COUNTS

Section 3

Patch	No. Planted	No. Dead	% Survival	No. Plants to be Installed Fall 2000
UF10	17	14	18%	8
UF11	57	28	51%	23
UF12	68	29	57%	0
UF13	49	18	63%	0
UF14	54	39	28%	29
UF15	26	6	77%	0
UF 16	6	3	50%	5
US25	51	17	67%	12
US26	34	11	68%	12
US27	51	16	69%	11
US28	80	29	64%	41
US29	21	2	90%	0
US30	46	22	52%	22
US31	27	11	59%	30
WF10	29	6	79%	36
WS18	38	9	76%	10
WS19	75	24	68%	51
WS20	33	3	91%	0
WS21	27	0	100%	0
WS22	14	0	100%	0
WS23	67	12	82%	0
WS24	55	6	89%	0
WS25	30	2	93%	0
WS26	27	0	100%	0
WS27	44	13	70%	15
Totals	**1026**	**320**	**69%**	**305**
Gd. Totals	**3238**	**989**	**69%**	**678**

Denotes average %

APPENDIX C

WETLAND AND UPLAND PLANT SPECIES IN EACH BASIN

APPENDIX D

FALL 2000 REPLACEMENT PLANTINGS

APPENDIX D
A1PI WETLAND MITIGATION
PROJECT PLANTING COMPLETION RECORD - FALL 2000
Wetland Patches

Patch	Species		Category	No.	Date
WF1	Acer rubrum	Red Maple	cover	2	15-Nov
	Nyssa sylvatica	Blackgum	diversity/aesthetics	2	15-Nov
	Quercus palustris	Pin Oak	cover	3	15-Nov
	Ulmus americana	American Elm	cover	3	15-Nov
WF2	Quercus palustris	Pin Oak	cover	3	15-Nov
	Platanus occidentalis	Sycamore	cover	1	15-Nov
WF3	Acer rubrum	Red Maple	cover	3	15-Nov
	Quercus palustris	Pin Oak	cover	6	15-Nov
	Ulmus americana	American Elm	cover	3	15-Nov
	Carpinus caroliniana	American Hornbeam	diversity/mast	3	7-Nov
	Fraxinus nigra	Black Ash	diversity	1	7-Nov
	Liquidambar styraciflua	Sweetgum	diversity	3	15-Nov
WF4	Nyssa sylvatica	Blackgum	diversity/aesthetics	2	15-Nov
	Quercus palustris	Pin Oak	cover	3	15-Nov
	Carpinus caroliniana	American Hornbeam	diversity/mast	1	7-Nov
	Fraxinus nigra	Black Ash	diversity	1	7-Nov
	Liquidambar styraciflua	Sweetgum	diversity	1	15-Nov
WF5	Acer rubrum	Red Maple	cover	0	
	Nyssa sylvatica	Blackgum	diversity/aesthetics	3	20-Nov
	Quercus palustris	Pin Oak	cover	4	16-Nov
	Acer saccharinum	Sugar Maple	cover	2	20-Nov
	Quercus bicolor	Swamp White Oak	cover	1	20-Nov
WF7	Acer rubrum	Red Maple	cover	4	27-Nov
	Quercus palustris	Pin Oak	cover	1	27-Nov
	Ulmus americana	American Elm	cover	2	27-Nov
WF9	Acer rubrum	Red Maple	cover	2	16-Nov
	Nyssa sylvatica	Blackgum	diversity/aesthetics	1	16-Nov
	Carpinus caroliniana	American Hornbeam	diversity/mast	1	6-Nov
	Liquidambar styraciflua	Sweetgum	diversity	0	
WF10	Acer rubrum	Red Maple	cover	3	15-Nov
	Nyssa sylvatica	Blackgum	diversity/aesthetics	4	15-Nov
	Quercus palustris	Pin Oak	cover	7	15-Nov
	Ulmus americana	American Elm	cover	1	15-Nov
	Platanus occidentalis	Sycamore	cover	3	15-Nov
	Carpinus caroliniana	American Hornbeam	diversity/mast	6	6-Nov
	Fraxinus nigra	Black Ash	diversity	2	6-Nov
	Liquidambar styraciflua	Sweetgum	diversity	7	15-Nov
	Acer saccharinum	Sugar Maple	cover	3	15-Nov
	Quercus bicolor	Swamp White Oak	cover	3	15-Nov

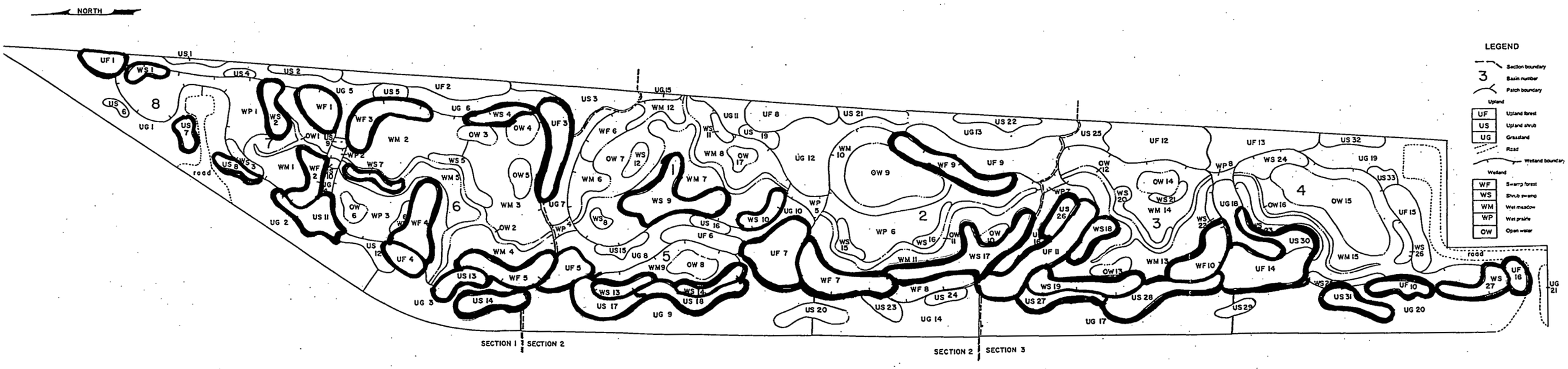
APPENDIX D
A1PI WETLAND MITIGATION
PROJECT PLANTING COMPLETION RECORD - FALL 2000
Wetland Patches

Patch	Species		Category	No.	Date
WS1	Alnus serrulata	Smooth Alder	cover	3	7-Nov
	Ilex verticillata	Winterberry	aesthetics	2	7-Nov
	Salix discolor	Pussy Willow	cover	2	7-Nov
WS2	Alnus serrulata	Smooth Alder	cover	5	7-Nov
	Ilex verticillata	Winterberry	aesthetics	1	7-Nov
	Spirea tomentosa	Steeplebush	aesthetics	5	7-Nov
	Ulnus rubra	Slippery Elm	cover	5	7-Nov
WS4	Alnus serrulata	Smooth Alder	cover	3	7-Nov
	Ilex verticillata	Winterberry	aesthetics	1	7-Nov
	Salix discolor	Pussy Willow	cover	2	7-Nov
	Aronia melanocarpa	Black Chokeberry	aesthetics	1	31-Oct
	Sambucus canadensis	Elderberry	fruit	3	31-Oct
	Viburnum dentatum	Southern Arrowood	cover	2	31-Oct
	Rhus	Smooth Sumac	cover	6	
WS7	Alnus serrulata	Smooth Alder	cover	2	6-Nov
	Ilex verticillata	Winterberry	aesthetics	2	7-Nov
	Salix discolor	Pussy Willow	cover	3	6-Nov
	Ulnus rubra	Slippery Elm	cover	2	6-Nov
	Sambucus canadensis	Elderberry	fruit	3	7-Nov
	Viburnum dentatum	Southern Arrowood	cover	5	7-Nov
WS9	Alnus serrulata	Smooth Alder	cover	5	
	Viburnum dentatum	Southern Arrowood	cover	6	2-Nov
	Hypericum prolificum	Shrubby St. John's Wort	diversity	2	2-Nov
	Rosa palustris	Swamp Rose	aesthetics	4	2-Nov
WS10	Alnus serrulata	Smooth Alder	cover	4	2-Nov
	Spirea tomentosa	Steeplebush	aesthetics	1	2-Nov
	Viburnum dentatum	Southern Arrowood	cover	4	2-Nov
	Rosa palustris	Swamp Rose	aesthetics	2	2-Nov
	Spirea alba	Meadowsweet	aesthetics	1	2-Nov
WS13	Alnus serrulata	Smooth Alder	cover	4	2-Nov
	Ilex verticillata	Winterberry	aesthetics	2	2-Nov
	Ulmus rubra	Slippery Elm	cover	4	2-Nov
	Sambucus canadensis	Elderberry	fruit	2	2-Nov
	Viburnum dentatum	Southern Arrowood	cover	7	2-Nov
WS14	Alnus serrulata	Smooth Alder	cover	3	
	Ilex verticillata	Winterberry	aesthetics	1	
	Spirea tomentosa	Steeplebush	aesthetics	2	2-Nov
	Ulmus rubra	Slippery Elm	cover	4	2-Nov
	Sambucus canadensis	Elderberry	fruit	1	2-Nov
	Viburnum dentatum	Southern Arrowood	cover	3	2-Nov

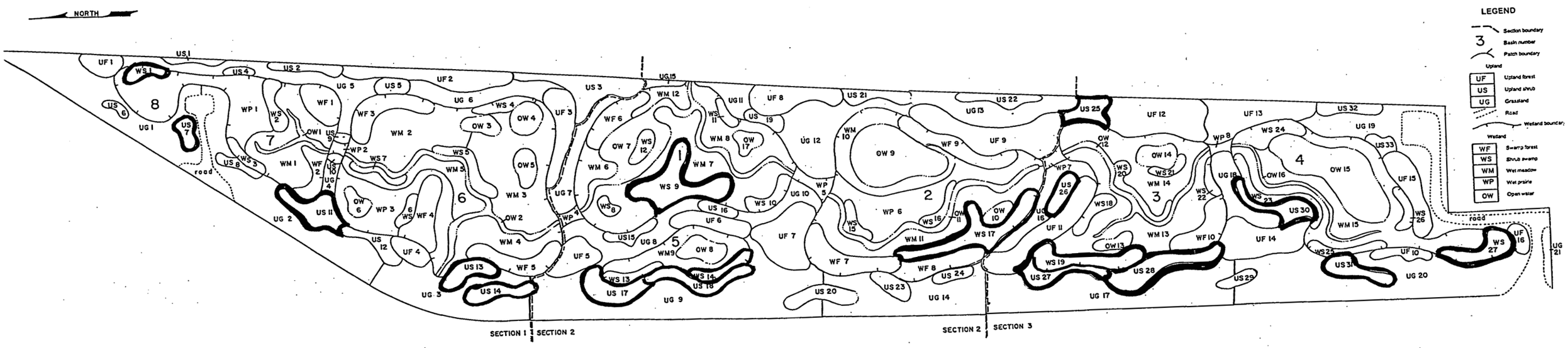
APPENDIX D
A1PI WETLAND MITIGATION
PROJECT PLANTING COMPLETION RECORD - FALL 2000
Wetland Patches

Patch	Species		Category	No.	Date
WS17	Alnus serrulata	Smooth Alder	cover	2	2-Nov
	Ulmus rubra	Slippery Elm	cover	3	2-Nov
	Sambucus canadensis	Elderberry	fruit	3	2-Nov
	Viburnum dentatum	Southern Arrowood	cover	2	2-Nov
	Hypericum prolificum	Shrubby St. John's Wort	diversity	4	2-Nov
	Spirea alba	Meadowsweet	aesthetics	6	2-Nov
	Rhus	Smooth Sumac	cover	3	
WS18	Alnus serrulata	Smooth Alder	cover	4	2-Nov
	Ulmus rubra	Slippery Elm	cover	3	2-Nov
	Sambucus canadensis	Elderberry	fruit	1	2-Nov
	Spirea alba	Meadowsweet	aesthetics	1	2-Nov
WS19	Salix discolor	Pussy Willow	cover	4	2-Nov
	Sambucus canadensis	Elderberry	fruit	1	2-Nov
	Spirea alba	Meadowsweet	aesthetics	5	2-Nov
	Cephalanthus occidentalis	Buttonbush	cover	35	2-Nov
	Rhus	Smooth Sumac	cover	5	
WS27	Alnus serrulata	Smooth Alder	cover	2	2-Nov
	Spirea tomentosa	Steeplebush	aesthetics	3	2-Nov
	Ulmus rubra	Slippery Elm	cover	1	2-Nov
	Sambucus canadensis	Elderberry	fruit	1	2-Nov
	Viburnum dentatum	Southern Arrowood	cover	1	2-Nov
	Hypericum prolificum	Shrubby St. John's Wort	diversity	4	2-Nov

Appendix D
Patches Planted In Fall 2000



Appendix D
Patches To Be Planted In Spring 2001



APPENDIX E

PERCENT COVER ESTIMATES

APPENDIX E
PERCENT NATIVE COVER ESTIMATES

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Basin	Percent Native Wetland Cover	Category	Native Plants
1	5-25%	Medium-Sparse	Rushes (*Juncus* sp.; *Scirpus* sp.), Little Bluestem, Indiangrass
2	0-5%	Sparse	Switchgrass
3	0-5%	Sparse	Switchgrass
4	0-5%	Sparse	Switchgrass
5	0-5%	Sparse	Rushes (*Juncus* sp.; *Scirpus* sp.), Water plantain
6	5-25%	Medium-Sparse	Prairie cordgrass, Indiangrass, Switchgrass
7	5-25%	Medium-Sparse	Prairie cordgrass, Big Bluestem
8	0-5%	Sparse	Indiangrass, Big Bluestem

APPENDIX F

WETLAND HYDROLOGY

APPENDIX F
WATER LEVEL AND SHALLOW WELLS MEASUREMENTS

Wetland Monitoring 2000 (A1PI Wetland Project)

Shallow Well Measurements

	Mar-00	Apr-00	May-00	Jun-00	Jul-00	Aug-00	Sep-00	Oct-00
Basin	**Depth (ft)[1]**	**Depth (ft)[1]**	**Depth (ft)[1]**	**Depth (ft)[1]**	**Depth (ft)[1]**	**Depth (ft)[1]**	**Depth (ft)[1]**	**Depth (ft)[1]**
1	0.16	0.93	0.92	0.94	0.32	1.22	1.06	0.4
2	0.18	0.3	0.32	0.38	0.28	1.32	1.34	0.54
3	0.12	0.1	0.1	under water	under water	under water	0.26	under water
4	under water	under water	under water	under water	under water	0.24	0.66	0.2
5	0.02	0.62	0.9	no water	0.66	no water	1.44	0.96
6	0.42	no water	no water	no water	no water	no water	no water	1.54
7	0.54	0.86	1	no water	0.58	1.04	no water	1.02
8	0.47	no water	dry	no water	no water	no water	no water (moist)	1.36

[1] depth from ground surface

Water Depths

Basin	Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)
1	1.1	1.1	1.2	1.15	1.2	1	1	1
2	1.6	1.4	1.5	1.45	1.6	1	0.8	1.1
4	1.6	1.5	1.5	1.3	1.5	1.1	1	1.3

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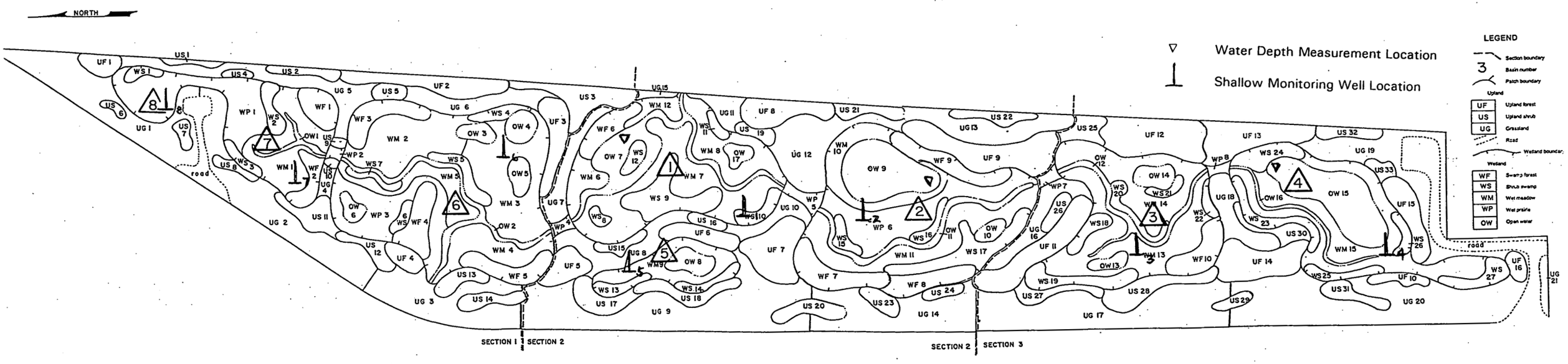
Appendix F
Water Depth and Shallow Well Locations



APPENDIX G

WATER QUALITY

APPENDIX G
WATER QUALITY - SURFACE WATER

March-00

Basin	Conductivity (mS/cm)[1]	Turbidity (NTU)[2]	D.O. mg/l	Temp (Celsius)	pH	Color	Odor
1	0.8	13	7.8	12.6	6.44	lt. Yellow	no
2	0.364	5	10.2	14.6	7.15	lt. Yellow	no
4	0.399	0	8.81	12.1	6.8	clear	no
5	0.93	0	10.36	12.6	6.59	clear	no
6	0.99	0	10.31	13.7	6.63	clear	no

May-00

Basin	Conductivity (mS/cm)[1]	Turbidity (NTU)[2]	D.O. mg/l	Temp (Celsius)	pH	Color	Odor
1	1	3	4.2	23	7.3	lt. Brown	no
2	0.46	4	6	23	7.1	lt. Brown	no
4	0.37	2	6.9	22	7.4	green	no
5	1.9	12	5.3	23	7.4	yellow/brown	no
6	1.2	2	4.4	23	7.6	lt. Green	no

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APPENDIX G
WATER QUALITY - SURFACE WATER

July-00

Basin	Conductivity (mS/cm)[1]	Turbidity (NTU)[2]	D.O. mg/l	Temp (Celsius)	pH	Color	Odor
1	0.64	9	6.35	23.1	8.25	clear	no
2	0.425	20	5.93	24.2	8.12	lt. Brown	no
4	0.336	11	6.75	24.3	7.21	green	slight
5	1.24	23	9.63	24.2	9.28	yellow/brown	fish smell
6	0.543	3	5.41	22.2	8.31	lt. Green	no

September-00

Basin	Conductivity (mS/cm)[1]	Turbidity (NTU)[2]	D.O. mg/l	Temp (Celsius)	pH	Color	Odor
1	0.645	1	8.01	24.5	8.94	clear	no
2	0.384	2	6.21	23	8.56	clear	no
4	0.3	4	7.5	23.8	9.15	clear	no
5	0.891	16	6.71	24.2	9.09	lt.brown	none
6	0.463	4	8.25	25.2	9.49	clear	no

[1] microsemens per centimeter

[2] nephelometric units

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APPENDIX H

WILDLIFE OBSERVATIONS

APPENDIX H
WILDLIFE OBSERVATIONS AT THE A1PI WETLAND FOR THE YEAR 2000

Birds:
Corus brachyrhynchos (American Crow)
Turdus migratorius (American Robin)
Hirundo rustic (Barn Swallow)
Anas discors (Blue-winged Teal)
Branta canadensis (Canada Goose)
Anas cyanoptera (Cinnamon Teal)
Bucephala clangula (Common Goldeneye)
Quiscalus quiscula (Common Grackle)
Sialia sialis (Eastern Bluebird)
Tyrannus tyrannus (Eastern Kingbird)
Sturnella magna (Eastern Meadowlark)
Sturnus vulgaris (European Starling)
Spizella pusilla (Field Sparrow)
Ardea herodias (Great Blue Heron)
Butorides striates (Green Heron)
Troglopytes aedon (House Wren)
Falco sparverius (Kestrel)
Charadrius vociferu (Killdeer)
Tringa flavipes (Lesser Yellowlegs)
Anas platyrhynchos (Mallard)
Zenaida macroura (Mourning Dove)
Carninalis cardinalis (Northern Cardinal)
Mimus polyglottos (Northern Mockingbird)
Progne subis (Purple Martin)
Buteo jamaicensis (Red tailed Hawk)
Agelaius phoeniceus (Red-winged Blackbird)
Archilochus colubris (Ruby-Throated Hummingbird)
Tringa solitaria (Solitary Sandpiper)
Melospiza melodia (Song Sparrow)
Tachycineta bicolor (Tree Swallow)
Cathartes aura (Turkey Vulture)
Aix sponsa (Wood Duck)

Herpetofauna:
Nerodia sipedon (Northern Watersnake)
Acris crepitans (Cricketfrog)
Rana catesbeina (Bullfrog)
Bufo americanus (American Toad)

Mammals:
Canis latrans (Coyote)
Sciurus niger (Fox Squirrel)
Procyon lotor (North American Raccoon)
Mephitis mephitis (Striped skunk)
Odocoileus virginianus (White-tailed Deer)

NESTING OBSERVATIONS
(A1PI WETLAND MITIGATION PROJECT FOR THE YEAR 2000)

Bird activity in boxes provided within the Wetland Mitigation Area of A1PI were checked on July 5, 2000. The nest, in each box containing a nest, was checked to determine if there had been any use by birds, to identify the type of nest or nests, and to determine the number of clutches of nestlings which had been possibly hatched.

The boxes have been identified with an alpha-numeric identifier that reflects the grass, shrub, or tree patch where the box is located. The final alpha character is represented as follows:

B - bats
D - ducks
K - kestrels
T - tree swallows
W - wren

Section 1

US3-W	One active wren nest
US11-T	One house sparrow nest (not active) was removed
WF4-W	Wasp nest in box
OW4-D	One mallard nest in box

Section 2

UG7-T	Three layers of nests were found in box. First nest was a bluebird nest. Second nest was a tree swallow nest. Current nest was a house sparrow nest with three eggs. All nests were removed from the box.
UF5-B	No signs of activity
UF5-W	Wasp nest along with mud dauber nest
US15-T	One tree swallow nest
UF6-B	No signs of activity
UF6-W	Active tree swallow nest with two eggs
UF8-K	One mallard nest in box
UF8-W	Wasp nest in box

US21-T	Two layers of nest were found in the box. The first was a bluebird nest and the current nest is a wren nest (unable to see if there are any eggs in the nest).
UF9-T	Two layers of nest were found in the box. The current nest is a tree swallow nest with five eggs. Unable to verify the type of bird in the first nest.
WF9-B	No current occupants in bat box, but some evidence of droppings on the side of paneling pieces in the box.

Section 3

Basin 3-W	Wasp nest found in box
Basin 4-W	Spider nest and wasp nest
US30-T	Two layers in box, with the first being a tree swallow nest and the current nest being a bluebird nest with three eggs
UG18-T	One nest in box, a bluebird nest
UF13-B	No current occupants, but evidence of possible past use
US32-T	Box had contained two tree swallow nests this season
UF15-W	No activity except by wasp

Nests were removed from boxes not showing any current activity.

APPENDIX I

MONITORING SCHEDULE

APPENDIX I
A1PI WETLAND MITIGATION MONITORING SCHEDULE

Monitoring Year	Task	Month
Year One (2000)		
80% survival	mortality count	September
80% cover	basin sampling	September
Water levels	measure water depths	Monthly (Mar-Oct)
Water quality	record observations	March, May, July, September
Wildlife presence	record observations	Monthly (Mar-Oct)
Visual change	photographs	May, September
Soils	baseline conditions	May
Nest box cleanout	cleanout/disinfect	winter
Year Two (2001)		
80% survival (if not in yr. 1)	mortality count	September
80% cover (if not in yr. 1)	patch sampling	September
Water levels	measure water depths	May,September
Water quality	record observations	May,September
Wildlife presence	record observations	May,September
Visual change	photographs	May, September
Nest box cleanout	cleanout/disinfect	winter
Year Three (2002)		
80% survival (if required)	mortality count	September
80% cover (if required)	patch sampling	September
Aquatic organisms	macroinvertebrates	May
Water levels	measure water depths	May,September
Water quality	record observations	May,September
Wildlife presence	record observations	May,September
Visual change	photographs	May, September
Aerial photographs	helicopter	Sept./Oct.
Nest box cleanout	cleanout/disinfect	winter
Year Four (2003)		
80% survival (if required)	mortality count	September
80% cover (if required)	patch sampling	September
Water levels	measure water depths	May,September
Water quality	record observations	May,September
Wildlife presence	record observations	May,September
Visual change	photographs	May, September
Nest box cleanout	cleanout/disinfect	winter
Year Five (2004)		
Ecological inventory	woody plant census	September
80% cover (if required)	patch sampling	September
Water levels	measure water depths	May,September
Water quality	record observations	May,September
Wildlife presence	record observations	May
Wetland flora	basin sampling	September
Visual change	photographs	May, September
Nest box cleanout	cleanout/disinfect	winter