Project Goal #1: At the end of the five year monitoring period the created wetland community should be a jurisdictional wetland as defined by current federal standards.

Objective: The created wetland should compensate for the loss of wetland.

Performance Criteria: The entire created wetland should satisfy the three criteria of the federal wetland definition: dominant hydrophytic vegetation, hydric soils and wetland hydrology.

A. Predominance of Hydrophytic Vegetation – More than 50% of the dominant plant species must be hydrophytic.

B. Presence of Hydric Soils – Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at this site.

C. Presence of Wetland Hydrology – The compensation area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season.*

Project Goal #2: A native, non-weedy, emergent wetland community will be created.

Objective: Planting the area with high quality native emergent vegetation should reduce the pressures from successional, non-native, weedy species.

Performance Criteria: At least 50% of the plant species present should be non-weedy, native, perennial species. Furthermore, none of the dominant plant species may be non-native, cattails, or reed canary grass.

Methods

Monitoring of this wetland mitigation site will begin in 2002 and continue for the standard five year monitoring period. Illinois Natural History Survey (INHS) personnel will monitor the biological parameters and Illinois State Geological Survey (ISGS) personnel will monitor hydrology. Herbaceous vegetation will be monitored annually using standard sampling techniques (Cox 1985). Transects have been established perpendicular to a baseline running from northeast to southwest. The baseline begins at the ISGS surface water monitoring station (RDS2) on the north end of the site and follows along a bearing of 205° through the middle of the site. Six transects will be located along this baseline. They will start at 30 m from RDS2 and continue at 50m intervals thereafter. Transects will alternate their orientation from the baseline, first running west from the baseline and then running east. Quadrats ($1m^2$) will be placed at 5m intervals along each transect, beginning with a quadrat at the baseline. A minimum of 30 $1m^2$ quadrats will be sampled annually. Results and status of the created wetland site will be submitted to the Illinois Department of Transportation (IDOT) in yearly monitoring reports. The likelihood of meeting the proposed goals and performance criteria will also be addressed. If, at any time during the monitoring period, it appears that the goals/performance criteria will not be

* In some cases wetland hydrology can be met when a site is inundated or saturated for 5% to 12.5% of the growing season (Environmental Laboratory 1987).

and average cover (calculated using midpoints for each cover class) will be used to compute relative frequency (frequency of a species relative to total observations) and relative cover (cover relative to total observed cover), respectively. These two relative values are averaged to determine the importance value for each species sampled. Importance values will be used to determine dominant species. "Dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50% of the total dominance measure for the stratum, plus any additional species comprising 20% or more of the total dominance measure for the stratum" (FICWD 1989; Tiner 1999).

Table 1. Cover classes used in vegetation sampling

Cover Class	Range of Cover (%)	Midpoint of Range (%)
1	0-5	3.0
2	5-25	15.0
3	25-50	37.5
4	50-75	62.5
5	75-95	85.0
6	95-100	97.5

(Daubenmire 1959)

B. Presence of Hydric Soils – Soils will be examined and described annually. A soil core collected from the same general area of the mitigation site will be examined for the presence of redoximorphic features. A detailed profile description of the soil using Munsell color charts to record soil colors will be included. Soil texture and structure will also be recorded. Hydric soils may develop slowly and characteristics may not be apparent during the first several years after project construction. In the absence of hydric soil indicators at that time, hydrologic data could be used as corroborative evidence that conditions favorable for hydric soil formation are present at the site.

C. Presence of Wetland Hydrology – The ISGS has been tasked to monitor hydrology at the proposed wetland site. To date they have installed two surface water monitoring stations (RDS1 and RDS2), a rain guage, two surface water staff gauges, and eleven monitoring wells (1S-8S and 10S-12S) (Watson and Sabatini 2002). ISGS personnel will measure water levels monthly. In addition, INHS scientists will survey the site annually for field indicators of wetland hydrology.

Project Goal #2

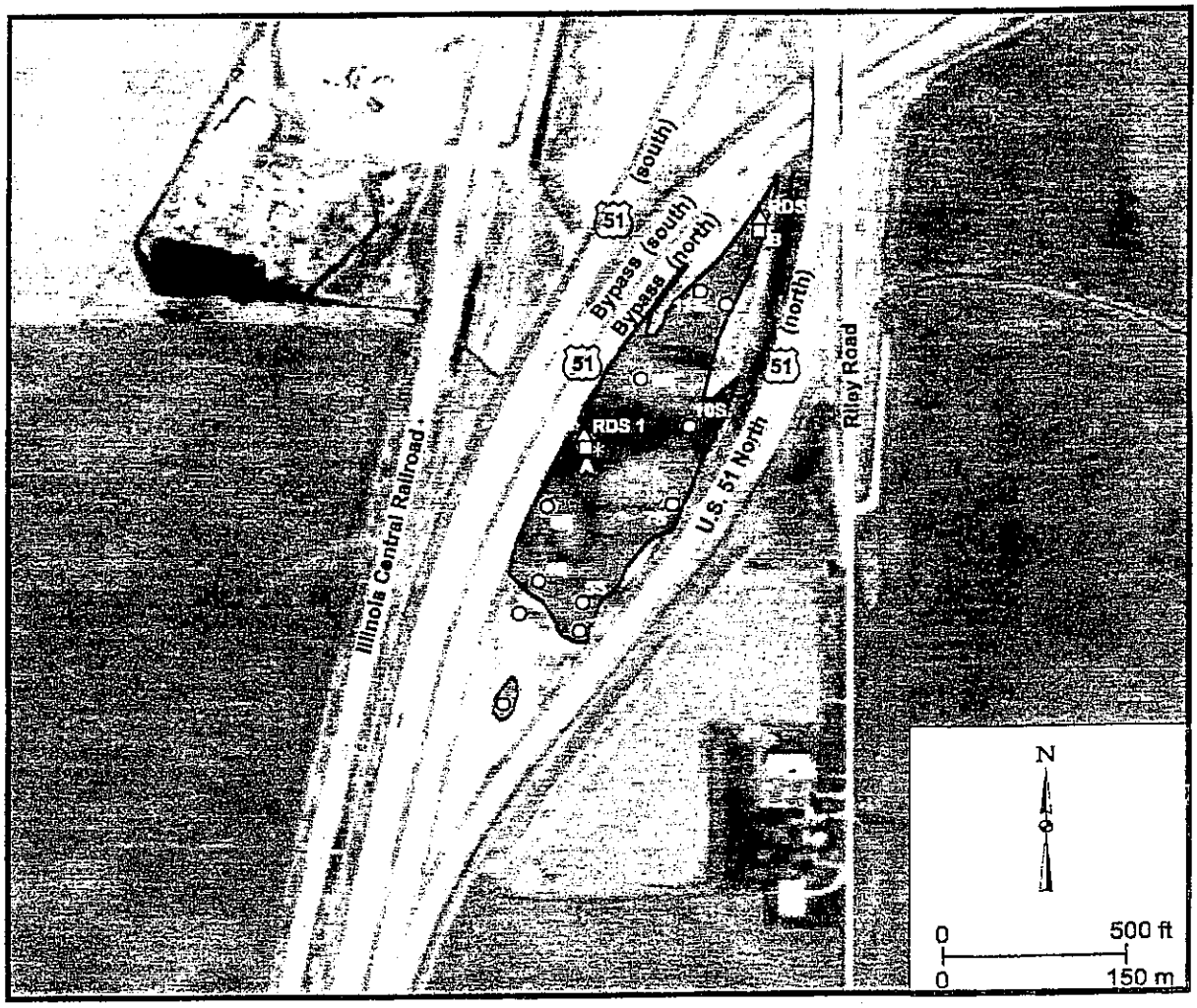
In 2002, we observed no evidence to suggest that planting was carried out at this site. A complete species list will be compiled each year and species will be recorded as native or non-native, weedy or non-weedy, and as a perennial, biennial, or an annual. Nativity of plants will be determined by consulting Mohlenbrock (1986). Weedy species, for the purposes of this report, are defined as all non-native species and any native species assigned a Coefficient of Conservatism of 0 or 1 (Taft *et al.* 1997). Species given a C value of 0-1 correspond to Grime's

Table 3. FAP 322 (U.S. 51) Wetland Mitigation Site vegetation sampling data including frequency, cover, and importance value for all species sampled in 2002.

Species	Indicator	Freq.	Rel Freq.	Cover	Rel Cover	Importance Value
Echinochloa muricata	**OBL**	**0.97**	**17.80**	**41.54**	**50.88**	**34.34**
Amaranthus tuberculatus	**OBL**	**0.72**	**13.21**	**7.76**	**9.50**	**11.36**
Hibiscus trionum	**UPL**	**0.59**	**10.83**	**3.59**	**4.40**	**7.62**
Polygonum pensylvanicum	FACW+	0.49	8.99	4.04	4.95	6.97
Cyperus esculentus	FACW	0.31	5.69	5.00	6.12	5.91
Panicum dichotomiflorum	FACW-	0.21	3.85	4.49	5.50	4.68
Setaria faberi	FACU+	0.31	5.69	2.05	2.51	4.10
Typha angustifolia	OBL	0.15	2.75	3.14	3.85	3.30
Abutilon theophrasti	FACU-	0.28	5.14	0.71	0.87	3.01
Sida spinosa	FACU	0.23	4.22	0.90	1.10	2.66
Eleocharis erythropoda	OBL	0.08	1.47	1.99	2.44	1.96
Ammania coccinea	OBL	0.13	2.39	0.96	1.18	1.78
Polygonum persicaria	FACW	0.15	2.75	0.38	0.47	1.61
Scirpus tabernaemontani	OBL	0.08	1.47	0.83	1.02	1.24
Asclepias incarnata	OBL	0.10	1.83	0.26	0.32	1.08
Cyperus acuminatus	OBL	0.08	1.47	0.51	0.62	1.05
Leersia oryzoides	OBL	0.03	0.55	0.96	1.18	0.87
Ipomaea hederacea	FAC	0.08	1.47	0.19	0.23	0.85
Coreopsis tinctoria	FAC-	0.05	0.92	0.45	0.55	0.74
Chaemasyce maculata	FACU-	0.05	0.92	0.45	0.55	0.74
Festuca pratensis	FACU-	0.05	0.92	0.45	0.55	0.74
Agrostis hyemalis	FAC-	0.05	0.92	0.13	0.16	0.54
Ipomaea lacunosa	FACW	0.05	0.92	0.13	0.16	0.54
Panicum capillare	FAC	0.03	0.55	0.38	0.47	0.51
Bidens tripartita	OBL	0.03	0.55	0.06	0.07	0.31
Portulaca oleracea	FAC-	0.03	0.55	0.06	0.07	0.31
Ratibida columnifera	UPL	0.03	0.55	0.06	0.07	0.31
Conyza canadensis	FAC-	0.03	0.55	0.06	0.07	0.31
Aster sp.	NA	0.03	0.55	0.06	0.07	0.31
Solidago canadensis	FACU	0.03	0.55	0.06	0.07	0.31
bare ground				33.85		
		5.45	100.00	81.65	100.00	100.00

Dominant species are in bold

Figure 1. 2002 aerial extent of wetland hydrology for FAP 322 wetland monitoring site (from ISGS, Watson and Sabatini 2002)



estimated areal extent of 2002 wetland hydrology within excavated area

○ monitoring well
□ stage gauge
△ RDS data logger
❄ rain gauge

Figure prepared by ISGS.

Summary and Recommendations

Floristic Quality Index – The Floristic Quality Index was very low for this newly created wetland mitigation site. The FQI was 7.8 and the mean C value was 1.6. These values are indicative of poor natural quality. However, the vegetation at this site is just beginning to be established. As is typical for recently disturbed areas, the naturally occurring vegetation is made up of weedy, early successional native and non-native species. Over time these species will likely be replaced by more conservative, perennial species that will form a more stable plant community. If that happens, the Floristic Quality Index and the mean C value should rise. It is recommended; however, that additional emergent hydrophytes be planted at this wetland creation to further insure that a high quality wetland community is created. A list of possible additions to the site is included in Table 5 below. These species are all known from this county and are suitable for wet prairie/marsh plant communities. Furthermore, the wetland compensation plan (IDOT 1996) states that the created wetland should be aesthetically appealing from the road. These species would help in this regard as well. Showy mesic to dry prairie species could also be planted in the buffer surrounding the excavated basin. *Andropogon gerardii*, *Eryngium yuccifolium*, *Liatris aspera*, *Liatris pycnostachya*, *Silphium laciniatum*, *Silphium terebinthinaceum*, and *Sorghastrum nutans* might be considered.

Table 5. Plant species recommended for wet prairie/marsh planting at the FAP 322 (U.S. 51) wetland mitigation site.

Scientific Name	Common Name	Stratum	Wetland Indicator Status	C♦	Perennial, Annual, Biennial
Asclepias incarnata	swamp milkweed	herb	OBL	4	Perennial
Bidens cernua	nodding beggar's ticks	herb	OBL	2	Annual
Boltonia asteroides	false aster	herb	FACW	5	Perennial
Calamagrostis canadensis	bluejoint grass	herb	OBL	3	Perennial
Carex spp.	sedge	herb	-----	--	Perennial
Cassia marilandica	Maryland senna	herb	FACW	4	Perennial
Cicuta maculata	water hemlock	herb	OBL	4	Biennial
Eupatorium maculatum	spotted Joe-Pye weed	herb	OBL	5	Perennial
Eupatorium perfoliatum	common boneset	herb	FACW+	4	Perennial
Helenium autumnale	autumn sneezeweed	herb	FACW+	3	Perennial
Hibiscus laevis	halberd-leaved rose mallow	herb	OBL	4	Perennial
Iris shrevei	southern blue flag	herb	OBL	5	Perennial
Lobelia cardinalis	cardinal-flower	herb	OBL	6	Perennial
Lobelia siphilitica	blue cardinal-flower	herb	FACW+	4	Perennial
Lythrum alatum	winged loosestrife	herb	OBL	5	Perennial
Mimulus alatus	winged monkey flower	herb	OBL	6	Perennial
Mimulus ringens	monkey flower	herb	OBL	5	Perennial
Polygonum amphibium	water smartweed	herb	OBL	3	Perennial
Pycnanthemum virginianum	common mountain mint	herb	FACW+	5	Perennial
Sagittaria latifolia	arrowhead	herb	OBL	4	Perennial
Sium suave	water parsnip	herb	OBL	5	Perennial
Spartina pectinata	freshwater cord grass	herb	FACW+	4	Perennial
Vernonia fasciculata	common ironweed	herb	FACW	5	Perennial

♦Coefficient of Conservatism (Taft *et al.* 1997)

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Appendix 1. Wetland Determination Forms

ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 2 of 4)

Field Investigators: Marcum, Kurylo, & Larimore
Date: 20 August, 24 September 2002
Project Name: FAP 322 (U.S. 51)
State: Illinois
County: Macon
Site Name: Wet Meadow
Legal Description: NE1/4, NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.
Location: This wet meadow is located approximately 1 mile south of Elwin, IL. It is primarily within the north half of the south infield at the U.S. Route 51-Riley Road interchange.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: NA
Depth to saturated soil: > 1.2 m (48 in) at 9-24-02 site visit.
Overview of hydrological flow through the system: This site is located in a depression surrounded by highway embankments. Water enters this site via precipitation, sheet flow from adjacent higher ground (road embankments), and drainage from a culvert under U.S. 51. Water leaves the site primarily via evapotranspiration and slowly through soil infiltration.
Size of watershed: Approximately 11.17 ha (27.6 ac) (IDOT 1996).
Other field evidence observed: This site has been excavated to hold water for longer periods. Bare areas indicating ponded water, algal mats, and mud cracks were observed at this site.

Wetland hydrology: Yes: X No:
Rationale: A depressional landscape position and field evidence of saturation suggest that this site is saturated long enough during the growing season to meet the wetland hydrology criterion. This is supported by ISGS well data for this site. Watson and Sabatini (2002) concluded that 3.0 ha (7.4 ac) conclusively satisfied the wetland hydrology criterion.

DETERMINATION AND RATIONALE:

Is the site a wetland? Yes: X No:
Rationale for decision: Dominant hydrophytic vegetation is already in place at this site and wetland hydrology appears to be present within the excavated depression. Hydric soils are present in part while conditions favorable for hydric soil development are present throughout the depression. This site is well on the way to becoming a wetland. The total extent of the wetland will be determined at the end of the five year monitoring period.

ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 4 of 4)

Field Investigators: Marcum, Kurylo, & Larimore
Date: 20 August, 24 September 2002
Project Name: FAP 322 (U.S. 51)
State: Illinois
County: Macon
Site Name: Wet Meadow
Legal Description: NE1/4, NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.
Location: This wet meadow is located approximately 1 mile south of Elwin, IL. It is primarily within the north half of the south infield at the U.S. Route 51-Riley Road interchange.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C♦	
Polygonum pensylvanicum	giant smartweed	herb	FACW+	1	Annual
Polygonum persicaria	spotted lady's thumb	herb	FACW	*	Annual
Populus deltoides	eastern cottonwood	shrub	FAC+	2	Perennial
Portulaca oleracea	purslane	herb	FAC-	*	Annual
Ratibida columnifera	long-headed coneflower	herb	UPL	*	Perennial
Rorippa sp.	yellow cress	herb	-----	--	----------
Rumex crispus	curly dock	herb	FAC+	*	Perennial
Scirpus tabernaemontanii	great bulrush	herb	OBL	4	Perennial
Setaria faberi	giant foxtail	herb	FACU+	*	Annual
Setaria glauca	pigeon grass	herb	FAC	*	Annual
Setaria viridis	common foxtail	herb	UPL	*	Annual
Sida spinosa	prickly sida	herb	FACU	*	Annual
Solidago canadensis	Canada goldenrod	herb	FACU	1	Perennial
Typha angustifolia	narrow-leaved cattail	herb	OBL	*	Perennial
Xanthium strumarium	cocklebur	herb	FAC	0	Annual

♦ Coefficient of Conservatism (Taft *et al.* 1997)
*Non-native species

mean C value (mCv) = $\sum C/N = 38/24 = 1.6$
FQI = mCv ($\sqrt{N}$) = $1.6(\sqrt{24}) = 7.8$

Determined by: Paul Marcum & Rick Larimore (vegetation and hydrology)
Jesse Kurylo (soils and hydrology)
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(217) 333-8459 (Marcum)

ROUTINE ON-SITE WETLAND DETERMINATION

Site #2 (page 2 of 4)

Field Investigators: Marcum, Kurylo, & Larimore
Date: 20 August, 24 September
Project Name: FAP 322 (U.S. 51)
State: Illinois
County: Macon
Site Name: Non-native Grassland
Legal Description: NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.
Location: This non-native grassland is located approximately 1 mile south of Elwin, IL. It is primarily within the south half of the south infield at the U.S. Route 51-Riley Road interchange. This site also extends around site #1 in the north section of the infield.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: NA
Depth to saturated soil: > 1.2 m (48 in) at 9-24-02 site visit.
Overview of hydrological flow through the system: This site is at a slightly to noticeably higher elevation than site #1. It is level to slightly sloping. Water enters this site via precipitation and sheet flow from adjacent higher ground. Water leaves the site via evapotranspiration, soil infiltration, and through sheet flow into site #1.
Size of watershed: Approximately 11.17 ha (27.6 ac) (IDOT 1996).
Other field evidence observed: none

Wetland hydrology: Yes: No: X
Rationale: Field observations suggest that this site is both too high of elevation and too sloping to satisfy the wetland hydrology criterion. In our opinion, the site is not saturated long enough during the growing season to meet the wetland hydrology criterion.

DETERMINATION AND RATIONALE:

Is the site a wetland? Yes: No: X
Rationale for decision: Dominant hydrophytic vegetation, hydric soils, and wetland hydrology were all absent; therefore, this site is not a wetland. The National Wetland Inventory did not code this site as a wetland.

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ROUTINE ON-SITE WETLAND DETERMINATION

Site #2 (page 4 of 4)

Field Investigators: Marcum, Kurylo, & Larimore
Date: 20 August, 24 September
Project Name: FAP 322 (U.S. 51)
State: Illinois
County: Macon
Site Name: Non-native Grassland
Legal Description: NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.
Location: This non-native grassland is located approximately 1 mile south of Elwin, IL. It is primarily within the south half of the south infield at the U.S. Route 51-Riley Road interchange. This site also extends around site #1 in the north section of the infield.

SPECIES LIST (continued)

Scientific name	Common name	Stratum	Wetland indicator status	C♦
Lactuca serriola	prickly lettuce	herb	FAC	*
Lepidium sp.	pepper-grass	herb	-----	--
Medicago sativa	alfalfa	herb	UPL	*
Oxalis dillenii	yellow wood sorrel	herb	FACU	0
Panicum capillare	witch grass	herb	FAC	0
Panicum dichotomiflorum	fall panicum	herb	FACW-	0
Polygonum pensylvanicum	giant smartweed	herb	FACW+	1
Polygonum persicaria	spotted lady's thumb	herb	FACW	*
Polygonum sp.	smartweed	herb	-----	--
Poinsettia dentata	wild poinsettia	herb	UPL	0
Ratibida columnifera	long-headed coneflower	herb	UPL	*
Rorippa sp.	yellow cress	herb	-----	--
Rumex crispus	curly dock	herb	FAC+	*
Setaria faberi	giant foxtail	herb	FACU+	*
Setaria glauca	pigeon grass	herb	FAC	*
Setaria viridis	common foxtail	herb	UPL	*
Sida spinosa	prickly sida	herb	FACU	*
Solanum carolinense	horse nettle	herb	FACU-	0
Solidago canadensis	Canada goldenrod	herb	FACU	1
Trifolium hybridum	Alsike clover	herb	FAC-	*
Trifolium pratense	red clover	herb	FACU+	*
Trifolium repens	white clover	herb	FACU+	*

♦ Coefficient of Conservatism (Taft *et al.* 1997)
*Non-native species

mean C value (mCv) = $\sum C/N$ = 23/24 = 0.96
FQI = mCv ($\sqrt{N}$) = 0.96($\sqrt{24}$) = 4.7

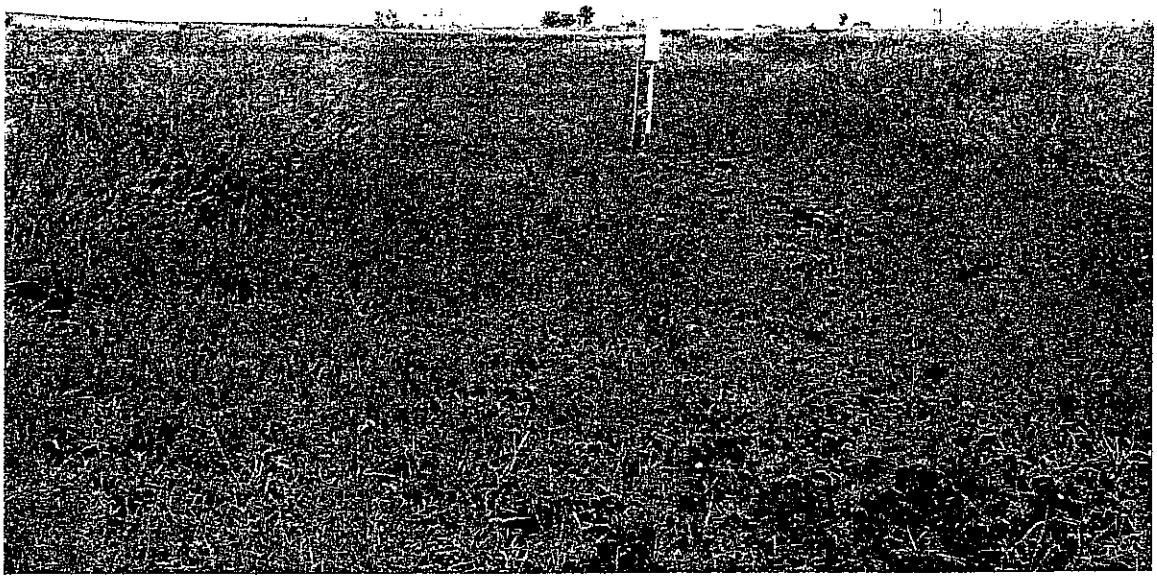

Photo 1. View from north end of wetland, looking south. A line from the surface water monitoring station (RDS-2) in the foreground to the right side of the road sign in the background is approximately 205° bearing. This is the location of the baseline established for vegetative sampling.

Photo 2. View from east side of the wetland looking toward the *Typha angustifolia* patch near U.S. 51.

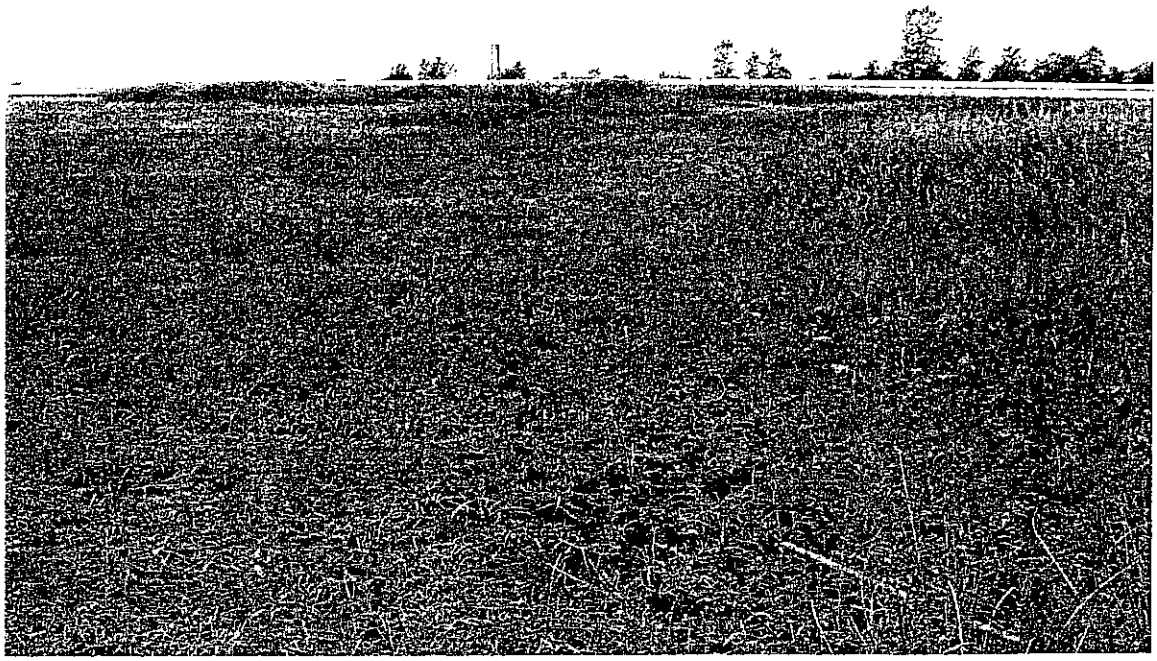

Photo 3. Looking south from the middle of the wetland near the north end.

Photo 4. View from the south end of the wetland looking north. Note *Festuca pratensis* in the foreground. This is site #2, the non-native grassland.

Photo 5. View of site #2, the non-native grassland from near the south end of the wetland.

Photo 6. View of *Typha angustifolia* patch looking east from along U.S. 51.