Wetland Mitigation Monitoring Report
FAP 14 (IL 3)
Eckmann-Bischhoff Property
Madison Co., IL

Introduction and Project Description

Roadwork on FAP 14 (IL 3) resulted in wetland impacts. Compensation for these impacts is proposed on the Eckmann-Bischoff property near Collinsville, IL, Madison Co. (Legal location: T 3 N, R 9 W, Sect. 25, S/2 and NE/4, NE/4 and N/2, SE/4). This 25.1 ha (62 acre) tract occurs within an abandoned Mississippi River oxbow and is bordered by forested wetland and marsh to the south and east and Cahokia Canal levee to the west. The forested land to the south is listed as Illinois Natural Area – Levee Lake and is in public ownership. The property, consisting of cropland considered to be nonwetland by the NRCS, was acquired by the IDOT in 1995 (Plocher et al, 1994) and 1997 (Keene et al. 1997). Wetland and natural area restoration was to proceed by natural revegetation utilizing the soil seed bank and colonization from adjacent marsh and forested wetland (Thomas Brooks personal comm.). As of 2000, 17 ha (42 acres) of wetlands (marsh and wet shrubland) had developed on the site (Ketzner et al. 2001); this was found to be the approximate area of wetland in 2002. Monitoring of the site began in 2002 and may continue for five years. However, since the site has been developing natural vegetation for seven years, it is conceivable that two or three years of monitoring could be sufficient, if stable plant communities and hydrology can be demonstrated.

Project Goals, Objectives, and Performance Criteria

Proposed goals and objectives for the wetland mitigation project are based on information contained in the original IDOT project request (Brooks, 2002). Performance criteria are based on those specified in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987), and Guidelines for Developing Mitigation Proposals (USACOE, 1993). Each goal should be attained by the end of the five year monitoring period. Project goals, objectives, and performance criteria are listed below.

Restored Wetland Site

Project Goal # 1: The wetland mitigation area should be determined to be jurisdictional wetland by current federal definition.

Objective: The restored wetland should compensate for the loss of wetlands.

Performance Criteria: The entire restored 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 the 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: The wetland compensation should meet minimum standards as to floristic composition and vegetational cover.

Objective: The wetland restoration should compensate for loss of wetlands. The site will be allowed to revegetate naturally. Wetlands of good quality border the site and the soil seed bank may be intact. The wetland compensation should be composed of vegetation characteristic of wetlands in the region.

Performance Criteria: The restored wetland communities shall support hydrophytic vegetation with at least 50%* cover after five years. None of the three most dominant species in any layer of any wetland community shall be exotic or listed IL noxious species. No wetland community shall consist of more than 50% exotic species.

Methods

Monitoring will be performed on the restored wetland site and will begin in 2002. Illinois Natural History Survey personnel will monitor the biological parameters and Illinois State Geological Survey personnel will monitor hydrology. Yearly sampling will be conducted and yearly monitoring reports will be submitted to the Illinois Department of Transportation on the status of the restored wetland site. Aerial extent of wetlands will be measured in the field. 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 or performance criteria will not be met at the end of the five-year monitoring period, written management recommendations will be made to IDOT in an effort to correct any problems.

*This goal was changed from 75% (Plocher et al. 2002) to 50% based on examination of Marsh (Type1) which had 65% cover. Long periods of inundation may lead to fairly high percentages of bare ground.

Project Goal # 1

A. Predominance of Hydrophytic Vegetation - The method for determining dominant hydrophytic vegetation is described in Environmental Laboratory (1987) and Federal Interagency Committee for Wetland Delineation (1989). This method is based on aerial coverage estimates for individual plant species. Each of the dominant plant species is then assigned a wetland indicator status rating (Reed, 1988). Any plant rated facultative or wetter (i.e., FAC, FAC+, FACW, and OBL) is considered hydrophytic. A predominance of hydrophytic vegetation in the wetland plant community exists if more than 50% of the dominant species present are hydrophytic.

B. Presence of Hydric Soils - Soils will be examined and described annually. Soil cores collected from the same general areas of the mitigation site will be examined for the presence of redoximorphic features. Detailed profile descriptions of the soil or soils using Munsell color charts will be included.

C. Presence of Wetland Hydrology - The Illinois State Geological Survey (ISGS) will install ground water monitoring wells at the site. ISGS personnel will measure water levels monthly. In addition, the site will be surveyed annually for field indicators of wetland hydrology.

Project Goal # 2

All of the restored wetland areas will be sampled yearly. Plant species cover and total cover will be determined through quantitative quadrat sampling. A baseline will be established along the southern border of the site. Transects will be set perpendicular to the baseline and extend across each of the areas. At regular intervals 1 m^2 quadrats will be sampled for understory vegetation and 100 m^2 plots for shrub/sapling layer. Vegetation will be tallied by species and percent cover. Species specific importance values, density of woody vegetation, and total vegetative cover will be calculated. The importance value for each understory species will be calculated as the sum of the percent relative cover and percent relative frequency, divided by two and expressed as a percent. The importance values for shrub/saplings will be calculated as the sum of relative frequency and relative density divided by two and expressed as a percent. Sampling and analysis methods are based on standard vegetation sampling procedures (Smith, 1980; Cox, 1985). A species list for each wetland community will be prepared annually and Floristic Quality Index calculated. Photographs will be taken yearly at permanent photo stations, in order to document plant community development.

Included with the assessment of a site is its Floristic Quality Index, developed by Swink and Wilhelm (1979), Swink and Wilhelm (1994) and modified by Taft et al. (1997). Although the Index is not a substitute for quantitive vegetation analysis in assessing plant communities, it provides a measure of the floristic integrity or level of distubance of a site. Each plant species native to Illinois is assigned a rating between 0 and 10 (the Coefficient of Conservatism). The rating number given to each plant is subjective and indicates the likelihood of finding the plant on an undisturbed site in a natural plant

community. A plant species that has a low Coefficient of Conservatism (C) is common and is likely to tolerate disturbed conditions; a species with a high C is relatively rare and is likely to require specific, undisturbed habitats.

The Floristic Quality Index (FQI) is calculated as follows: $FQI = \Sigma C/\sqrt{N}$, where ΣC represents the sum of the numerical ratings for all species recorded for a site, and N represents the number of plant species found on the site. The C value for each species is shown in the species list for the site. Species not native to Illinois (indicated by * in the species list) are not included in the calculations. Plants not identified to species level are not rated and are also not included in the calculations. An Index score below five indicates a highly disturbed site: a score below 10 suggests a less disturbed site of low natural quality. An FQI of 20 or more suggests that a site has evidence of good native character and may be considered an environmental asset. These calculations can fluctuate in their results seasonally as well as from one plant community to another. Due to seasonal variation, when doing annual surveys of a site it is best to duplicate the date as closely as possible. Communities may naturally differ in diversity and species composition.

The mean C value (also known as mean rated quality) was also calculated for each site. This value is calculated as follows: $mCv = \Sigma C/N$, where ΣC represents the sum of numerical ratings for all plant species recorded for a site, and N represents the number of plant species for a site. A mCv of greater than 3.0 indicates that a site probably has good native character

Results

Project Goal # 1: The wetland mitigation area should be determined to be jurisdictional wetland by current federal definition.

Wetland determininations by INHS and hydrologic data from ISGS (Ketterling et al. 2002, Figure 2) show that the wetland mitigation area meets all wetland criteria: predominance of hydrophytic vegetation, hydric soils and wetland hydrology. This data is located in Appendix 1, wetland determination sites 1, 2, and 3; and Appendix 2, Figures 1 and 2.

Site 1, Marsh (Type 1) – Dominant hydrophytic vegetation (*Typha angustifolia, Leersia oryzoides,* and *T. latifolia*), hydric soils, and wetland hydrology are all present. All criteria are met; therefore, this site is a wetland. This area was not coded by the NWI. This site provides good wildlife habitat and retains floodwater. Approximately 10.7 ha (26.6 acres) of this community lie within the project boundaries.

Site 2, Marsh (Type 2) – Dominant hydrophytic vegetation (*Phragmites australis, Aster simplex,* and *Leersia oryzoides*), hydric soils, and wetland hydrology are all present. All criteria are met; therefore, this site is a wetland. This site was not coded by the NWI. This site provides fair wildlife habitat and retains floodwater. Approximately 0.9 ha (2.3 acres) of this wetland lie within the project boundaries.

Site 3, Wet Shrubland – Dominant hydrophytic vegetation (*Populus deltoides, Toxicodendron radicans, Leersia oryzoides, Aster simplex,* and *Typha angustifolia*), hydric soils, and wetland hydrology are all present. All criteria are met; therefore, this site is a wetland. This site was not coded by the NWI. This site provides good wildlife habitat and retains floodwater. Approximately 5.5 ha (13.6 acres) of this wetland lie within the project boundaries.

Project Goal # 2: The wetland compensation should meet minimum standards as to floristic composition and vegetational cover.

A. Marsh (Type 1)

Predominance of Hydrophytic Vegetation With 50% Cover – This wetland is dominated by *Typha angustifolia, Leersia oryzoides, and Typha latifolia*; all rated OBL therefore meeting the hydrophytic vegetation criterion. Average cover of vegetation was 65%; meeting the minimum cover criterion (Table 1).

None of the Three Most Dominant Species in any Layer Shall be Exotic or Listed IL Noxious Species – Two of the dominants are natives, however, *Typha angustifolia* (narrowleaf cattail), is not, therefore this criterion is not met. No listed IL noxious species are dominants.

No More Than 50% Exotic Species - Only 7% (4 of 54) of the species in this wetland are exotics; therefore this criterion is met.

The FQI for this site was 19.9 which indicates a site of fair natural quality. The mCv was 2.7, indicating a site of fair native character.

Table 1. Marsh (Type 1) vegetation sampling data including: wetland indicator status, frequency, relative frequency, cover, relative cover and importance value for all species sampled in 2002.

Species	Indicator	Freq.	Rel. Freq.	Cover	Rel. Cover	Importance Value
*Typha angustifolia**	OBL	0.55	12.64	28.75	44.12	28.38
Leersia oryzoides	OBL	0.55	12.64	10.58	16.23	14.43
Typha latifolia	OBL	0.50	11.49	9.00	13.81	12.65
Eleocharis erythropoda	OBL	0.39	8.96	3.94	6.04	7.50
Sagittaria latifolia	OBL	0.39	8.96	0.58	0.89	4.92
Scirpus fluviatilis	OBL	0.17	3.90	3.83	5.88	4.89
Azolla mexicana	OBL	0.33	7.58	0.17	0.26	3.92
Eleocharis smallii	OBL	0.28	6.43	0.69	1.06	3.74
Phragmites australis	FACW+	0.06	1.38	2.11	3.24	2.31
Asclepias incarnata	OBL	0.11	2.53	1.11	1.70	2.11
Acer saccharinum	FACW	0.11	2.53	1.03	1.58	2.06
Carex hyalinolepis	OBL	0.11	2.53	1.03	1.58	2.06
Phyla lanceolata	OBL	0.16	3.68	0.08	0.12	1.90
Scirpus tabernaemontanii	OBL	0.11	2.53	0.19	0.29	1.41
Hibiscus laevis	OBL	0.06	1.38	0.86	1.32	1.35
Polygonum amphibium	OBL	0.06	1.38	0.86	1.32	1.35
unknown #1	-	0.11	2.53	0.05	0.07	1.30
Penthorum sedoides	OBL	0.06	1.38	0.16	0.24	0.81
Cyperus sp.	-	0.06	1.38	0.05	0.08	0.73
Eclipta prostrata	FACW	0.06	1.38	0.03	0.05	0.72
unknown #2	-	0.06	1.38	0.03	0.05	0.72
Xanthium strumarium	FAC	0.06	1.38	0.03	0.05	0.72
		4.35	99.97	65.16	99.98	99.98

* indicates exotic species

B. Marsh (Type 2)

Predominance of Hydrophytic Vegetation With 50% Cover – This wetland is dominated by: *Phragmites australis* (FACW+), *Aster simplex* (FACW), *Leersia oryzoides* (OBL), and *Acer saccharinum* (FACW); all with hydrophytic ratings, therefore meeting this criterion. Average cover of vegetation was 120%; meeting the minimum cover criterion (Table 2).

None of the Three Most Dominant Species in any Layer Shall be Exotic or Listed IL Noxious Species – The three most dominant species: *Phragmites australis, Aster simplex,* and *Leersia oryzoides,* are considered native; no noxious species are dominants, therefore this criterion is met.

No More Than 50% Exotic Species - Only 10% (3 of 28) of the species in this wetland are exotics; therefore this criterion is met.

The FQI for this site was 12.1 which indicates a site of fair natural quality. The mCv was 2.3, indicating a site of fair native character.

Table 2. Marsh (Type 2) vegetation sampling data including: wetland indicator status, frequency, relative frequency, cover, relative cover and importance value for all species sampled in 2002.

Species	Indicator	Freq.	Rel. Freq.	Cover	Rel. Cover	Importance Value
Phragmites australis	FACW+	0.75	13.63	52.87	44.21	28.92
Aster simplex	FACW	1.00	18.18	18.00	15.05	16.61
Leersia oryzoides	OBL	1.00	18.18	12.37	10.34	14.26
Acer saccharinum	FACW	1.00	18.18	12.37	10.34	14.26
Apocynum cannabinum	FAC	0.50	9.09	7.75	6.48	7.79
*Typha angustifolia**	OBL	0.50	9.09	7.75	6.48	7.79
Acer negundo	FACW-	0.25	4.54	3.87	3.24	3.89
Ulmus americana	FACW-	0.25	4.54	3.87	3.24	3.89
Fraxinus pennsylvanica	FACW	0.25	4.54	0.75	0.63	2.59
		5.5	99.97	119.60	100.01	100.00

* indicates exotic species

C. Wet Shrubland.

Predominance of Hydrophytic Vegetation With 50% Cover – This wetland is dominated by: *Populus deltoides* (FAC+), *Toxicodendron radicans* (FAC+), *Leersia oryzoides* (OBL), *Aster simplex* (FACW), and *Typha angustifolia* (OBL), all with hydrophytic ratings; therefore meeting this criterion. Average cover of vegetation was 113%; meeting the minimum cover criterion (Tables 3 & 4).

None of the Three Most Dominant Species in any Layer Shall be Exotic or Listed IL Noxious Species – None of the three most dominant species in any layer in this wetland are exotic or listed IL noxious species; therefore this criterion is met.

No More Than 50% Exotic Species - Only 8% (4 of 50) of the species in this wetland are exotics; therefore this criterion is met.

The FQI for this site was 19.4 which indicates a site of fair natural quality. The mCv was 2.7, indicating a site of fair native character.

Table 3. Wet Shrubland herbaceous vegetation sampling data including: wetland indicator status, frequency, relative frequency, cover, relative cover and importance value for all species sampled in 2002.

Species	Indicator	Freq.	Rel. Freq.	Cover	Rel. Cover	Importance Value
Toxicodendron radicans	FAC+	0.44	5.70	27.72	24.54	15.12
Leersia oryzoides	OBL	0.33	4.28	26.72	23.65	13.97
Aster simplex	FACW	0.66	8.56	12.80	11.33	9.94
*Typha angustifolia**	OBL	0.33	4.28	10.16	8.99	6.64
Apocynum cannabinum	FAC	0.56	7.26	5.83	5.16	6.21
Eleocharis erythropoda	OBL	0.33	4.28	5.16	4.57	4.43
Phyla lanceolata	OBL	0.22	2.85	5.94	5.26	4.05
Asclepias incarnata	OBL	0.33	4.28	1.00	0.88	2.58
Solidago canadensis	FACU	0.33	4.28	1.00	0.88	2.58
*Rumex crispus**	FAC+	0.33	4.28	0.72	0.64	2.46
Salix amygdaloides	FACW	0.22	2.85	2.05	1.81	2.33
Cynanchum laeve	FAC	0.33	4.28	0.33	0.29	2.29
Carex sp. #1	-	0.22	2.85	0.66	0.58	1.71
Cyperus acuminatus	OBL	0.22	2.85	0.66	0.58	1.71
Desmodium paniculatum	FACU	0.22	2.85	0.66	0.58	1.71
Lycopus americanus	OBL	0.22	2.85	0.66	0.58	1.71
Ipomoea lacunosa	FACW	0.22	2.85	0.39	0.35	1.60
Salix nigra	OBL	0.22	2.85	0.39	0.35	1.60
Acalypha rhomboidea	FACU	0.11	1.42	1.72	1.52	1.47
Carex vulpinoidea	OBL	0.11	1.42	1.72	1.52	1.47
Typha latifolia	OBL	0.11	1.42	1.72	1.52	1.47
Vitis cinerea	FACW-	0.11	1.42	1.72	1.52	1.47
Carex sp. #2	-	0.11	1.42	0.33	0.29	0.86
Elymus virginicus	FACW-	0.11	1.42	0.33	0.29	0.86
Hypericum punctatum	FAC+	0.11	1.42	0.33	0.29	0.86
Juncus dudleyi	FAC	0.11	1.42	0.33	0.29	0.86
Pycnanthemum tenuifolium	FAC	0.11	1.42	0.33	0.29	0.86
Salix exigua	OBL	0.11	1.42	0.33	0.29	0.86
Solidago gigantea	FACW	0.11	1.42	0.33	0.29	0.86
Ulmus americana	FACW-	0.11	1.42	0.33	0.29	0.86
Vitis riparia	FACW-	0.11	1.42	0.33	0.29	0.86
Bidens sp.	-	0.11	1.42	0.05	0.04	0.73
Cyperus esculentus	FACW	0.11	1.42	0.05	0.04	0.73
Echinochloa muricata	OBL	0.11	1.42	0.05	0.04	0.73
Iva annua	FAC	0.11	1.42	0.05	0.04	0.73
Penthorum sedoides	OBL	0.11	1.42	0.05	0.04	0.73
		7.71	99.84	112.95	99.91	99.91

* indicates exotic species

Table 4. Wet Shrubland shrub data including: density per 100 m^2, relative density, frequency, relative frequency, and importance value.

Species	Indicator	Density	Rel. Density	Freq.	Rel. Freq.	Importance Value
Populus deltoides	FAC+	33.55	80.53	0.89	38.36	59.45
Fraxinus pennsylvanica	FACW	3.78	9.06	0.66	28.45	18.75
Salix amygdaloides	FACW	1.66	4.00	0.44	18.96	11.48
Salix exigua	OBL	1.88	4.53	0.22	9.48	7.00
Salix nigra	OBL	0.78	1.87	0.11	4.74	3.30
		41.66	99.99	2.32	99.99	99.98

Summary and Discussion

All three wetland communities (Sites 1, 2, and 3, Figure1), an area of approximately 17.2 ha (42.5 acres) continue to meet all criteria of jurisdictional wetland by current federal definition.

This area continues to maintain generally fair natural quality with FQI scores from the three communities of 19.9, 12.1, and 19.4.

Some potential problems with exotic and invasive plant species do exist. *Typha angustifolia,* an exotic cattail is a dominant in both the Marsh (Type 1) and Wet Shrubland; it will likely increase in the future. Also, while considered native, *Phragmites australis* may also be considered invasive and commonly crowds out many native species. *P. australis* is a dominant in Marsh (Type 2).

A small ditch dug in the levee at the southeast corner of the project area (Figure 4) probably has varying effects on the hydrology of the area; sometimes allowing water to leave perhaps to the detriment of the wetlands, or allowing water to enter the project area, perhaps to the benefit of the wetlands. We know nothing of the origin of this ditch.

Changes in diversity and species composition can be expected in the Wet Shrubland community as the tree species mature and the canopy closes over. This is a natural progression back to forest; which probably dominated the shrub area in the past.

The ISGS hydrological report for 2002 (Figure 2) shows an expansion of the area with wetland hydrology to 21.4 ha (53.0 acres), up from the ISGS 2001 figure of 12.7 ha (31.4 acres). We feel that this expansion is probably temporary due to a wet spring in 2002, and that the area of wetland will remain approximately 17.2 ha (42.5 acres) (Figure 1).

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Appendix 1
(wetland determinations)

ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 1 of 4)

Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Marsh (Type 1)
Legal Description: S 1/2, NE 1/4, Sec. 25, T3N, R9W
Location: Covering most of the former Eckmann Property, extending slightly into the former Bischoff Property (Figure 1., #1 – A1)

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
Typha angustifolia	OBL	herb
Leersia oryzoides	OBL	herb
Typha latifolia	OBL	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:
Rationale: Over 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: NRCS mapped as Beaucoup silty clay loam; revised to Birds silt loam (Typic Fluvaquent)

On county hydric soils list?	Yes: X	No:	
Is the soil a histosol?	Yes:	No: X	
Histic epipedon present?	Yes:	No: X	
Redox concentrations:	Yes: X	No:	Color: 10YR 3/4
Redox depletions:	Yes:	No: X	Color: NA

Matrix color: N 4/
Other indicators: none

Hydric soils: Yes: X No:
Rationale: The Natural Resources Conservation Service identifies Birds as a Typic Fluvaquent which is poorly drained. This soil possesses redox concentrations within a gleyed matrix, which indicates saturated or reduced conditions for long duration during the growing season. Therefore, the soil at this site meets the hydric soil criterion.

ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 2 of 4)

Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Marsh (Type 1)
Legal Description: S 1/2, NE 1/4, Sec. 25, T3N, R9W
Location: Covering most of the former Eckmann Property, extending slightly into the former Bischoff Property (Figure 1., #1 – A1)

HYDROLOGY

Inundated: Yes: X No: Depth of standing water: 0 – 0.3 m (0 – 1 ft)
Depth to saturated soil: at surface
Overview of hydrological flow through the system: This site receives water through precipitation, sheet flow from higher ground, and possibly from backflow via Schneider Ditch (Rorick, 1994). Water leaves the site via evapotranspiration and possibly by sheet flow into Schneider Ditch on occasions.
Size of watershed: < 13 km^2 (5 mi^2)
Other field evidence observed: This site is bordered to the east and south by drainage ditches. Two shallow ditches run through the site and empty into these bordering ditches. This site is lower than ground to the north and the west; inundation is commonly observed. Well data collected by the Illinois State Geological Survey indicates that all of this site conclusively met the criterion for wetland hydrology this year (Ketterling and Robinson 2002).

Wetland hydrology: Yes: X No:
Rationale: The relatively low landscape position, inundation and saturation at the surface, and well data indicate that wetland hydrology is present. The ditch system in and around this site does not appear to effectively drain it. In our opinion, this site is flooded or saturated long enough to meet the wetland hydrology criterion. ISGS data (Ketterling and Robinson 2002), shows wetland hydrology.

DETERMINATION AND RATIONALE:

Is the site a wetland? Yes: X No:
Rationale for decision: Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are all present. This site meets all of the wetland criteria. The NWI does not code this site as a wetland.

Determined by: Rick Larimore, Allen Plocher, David Ketzner, & Paul Marcum (vegetation and hydrology), Scott Wiesbrook (soils and hydrology)
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ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 3 of 4)

Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Marsh (Type 1)
Legal Description: S 1/2, NE 1/4, Sec. 25, T3N, R9W
Location: Covering most of the former Eckmann Property, extending slightly into the former Bischoff Property (Figure 1., #1 – A1)

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C†
Acer saccharinum	silver maple	sapling, shr, h	FACW	1
Alisma plantago-aquatica	broad-leaf water-plantain	herb	OBL	2
Ammannia coccinea	long-leaved ammannia	herb	OBL	5
Apocynum cannabinum	dogbane	herb	FAC	3
Asclepias incarnata	swamp milkweed	herb	OBL	4
Aster simplex	panicled aster	herb	FACW	3
Bidens frondosa	common beggar-ticks	herb	FACW	1
Bidens tripartita	beggar-tick	herb	OBL	2
Azolla mexicana	Mexican azolla	herb	OBL	8
Carex crus-corvi	sedge	herb	OBL	6
Carex hyalinolepis	sedge	herb	OBL	4
Cyperus acuminatus	taperleaf flat sedge	herb	OBL	2
Cyperus esculentus	yellow nut-sedge	herb	FACW	0
Cyperus ferruginescens	rusty nut-sedge	herb	OBL	1
Cyperus strigosus	straw colored flatsedge	herb	FACW	0
Echinochloa muricata	barnyard grass	herb	OBL	0
Eleocharis erythropoda	red-rooted spikerush	herb	OBL	3
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Eupatorium serotinum	late boneset	herb	FAC+	1
Eclipta prostrata	yerba de tajo	herb	FACW	2
Eleocharis erythropoda	red-rooted spike rush	herb	OBL	3
Eleocharis smallii	spike rush	herb	OBL	5
Fraxinus pennsylvanica	green ash	sapling, shr, h	FACW	2
Hibiscus laevis	halberd-leaved rose mallow	herb	OBL	4
Ipomoea lacunosa	white morning-glory	herb	FACW	1
Juncus torreyi	Torrey's rush	herb	FACW	3
Lemna minor	common duckweed	herb	OBL	3
Leptochloa fascicularis	bearded sprangle top	herb	OBL	0
Lindernia dubia	false pimpernel	herb	OBL	5
Ludwigia peploides	creeping water primrose	herb	OBL	5

(continued)

ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 4 of 4)

Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Marsh (Type 1)
Legal Description: S 1/2, NE 1/4, Sec. 25, T3N, R9W
Location: Covering most of the former Eckmann Property, extending slightly into the former Bischoff Property (Figure 1., #1 – A1)

SPECIES LIST (continued)

Scientific name	Common name	Stratum	Wetland indicator status	C†
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lycopus americanus	common water horehound	herb	OBL	3
Mimulus alatus	winged monkey flower	herb	OBL	6
Polygonum lapathifolium	smartweed	herb	FACW+	0
Polygonum pensylvanicum	giant smartweed	herb	FACW+	1
Polygonum persicaria	spotted lady's thumb	herb	FACW	*
Polygonum punctatum	dotted smartweed	herb	OBL	3
Populus deltoides	eastern cottonwood	sapling, shr, h	FAC+	2
Potamogeton nodosus	American pondweed	herb	OBL	7
Rumex crispus	curly dock	herb	FAC+	*
Rumex altissimus	pale dock	herb	FACW-	2
Salix amygdaloides	peach-leaved willow	sapling, shr	FACW	4
Salix exigua	sandbar willow	shrub, h	OBL	1
Salix nigra	black willow	sapling, shr, h	OBL	3
Setaria faberi	giant foxtail	herb	FACU+	*
Solidago canadensis	Canada goldenrod	herb	FACU	1
Mentha arvensis villosa	field mint	herb	FACW	4
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Phragmites australis	common red reed	herb	FACW+	1
Phyla lanceolata	fog-fruit	herb	OBL	1
Polygonum amphibium	water smartweed	herb	OBL	3
Polygonum hydropiperoides	mild water pepper	herb	OBL	4
Sagittaria latifolia	arrowhead	herb	OBL	4
Scirpus fluviatilis	river bulrush	herb	OBL	3
Scirpus tabernaemontanii	great bulrush	herb	OBL	4
Typha angustifolia	narrow-leaved cattail	herb	OBL	*
Typha latifolia	cattail	herb	OBL	1
Xanthium strumarium	cockle bur	herb	FAC	0

†Coefficient of Conservatism (Taft *et al.* 1993); mean C value (mCv) = $\sum C/N = 146/54 = 2.7$
*Non-native species FQI = $\sum C/\sqrt{N} = 146/\sqrt{54} = 19.9$
key to abbreviations: sap = sapling, shr = shrub, h = herb, wdy vin = woody vine

ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 1 of 3)

Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Marsh (Type 2)
Legal Description: S 1/2, SW 1/4, NE 1/4, Sec. 25, T3N, R9W
Location: Southwest corner of site on the former Bischoff Property (Figure 1., #2 – A2)

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
Phragmites australis	FACW+	herb
Aster simplex	FACW	herb
Leersia oryzoides	OBL	herb
Acer saccharinum	FACW	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:
Rationale: Over 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: NRCS mapped as Beaucoup silty clay loam, wet; revised to Birds silt loam (Typic Fluvaquent)

On county hydric soils list?	Yes: X	No:	
Is the soil a histosol?	Yes:	No: X	
Histic epipedon present?	Yes:	No: X	
Redox concentrations:	Yes: X	No:	Color: 7.5YR 4/6
Redox depletions:	Yes:	No: X	Color: NA

Matrix color: 2.5Y 3/1 over N 4/
Other indicators: none

Hydric soils: Yes: X No:
Rationale: The Natural Resources Conservation Service identifies Birds as a Typic Fluvaquent which is poorly drained. This soil posesses redox concentrations within a low chroma and gleyed matrix, which indicates saturated or reduced conditions for long duration during the growing season. Therefore, the soil at this site meets the hydric soil criterion.

ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 2 of 3)

Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Marsh (Type 2)
Legal Description: S 1/2, SW 1/4, NE 1/4, Sec. 25, T3N, R9W
Location: Southwest corner of site on the former Bischoff Property (Figure 1., #2 – A2)

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: NA
Depth to saturated soil: at surface
Overview of hydrological flow through the system: This site receives water through precipitation and sheet flow from higher ground. Water leaves the site via evapotranspiration.
Size of watershed: < 2.6 km^2 (1 mi^2)
Other field evidence observed: This site is lower than surrounding ground and is separated from Schneider Ditch by a berm. This berm and the berm along the Cahokia Canal hold water within this site. Inundation has been observed.

Wetland hydrology: Yes: X No:
Rationale: The relatively low landscape position and the visual observation of inundation and saturation at the surface indicate that wetland hydrology is present. In our opinion, this site is flooded or saturated long enough to meet the wetland hydrology criterion. ISGS data (Ketterling and Robinson 2002), shows wetland hydrology.

DETERMINATION AND RATIONALE:

Is the site a wetland? Yes: X No:
Rationale for decision: Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are all present. This site meets all of the wetland criteria. The NWI does not code this site as a wetland.

Determined by: Rick Larimore, Allen Plocher, David Ketzner, & Paul Marcum (vegetation and hydrology)
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ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 3 of 3)

Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Marsh (Type 2)
Legal Description: S 1/2, SW 1/4, NE 1/4, Sec. 25, T3N, R9W
Location: Southwest corner of site on the former Bischoff Property (Figure 1., #2 – A2)

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C†
Acer negundo	box elder	herb	FACW-	1
Acer saccharinum	silver maple	herb	FACW	1
Apios americana	groundnut	herb	FACW	4
Apocynum cannabinum	dogbane	herb	FAC	3
Asclepias incarnata	swamp milkweed	herb	OBL	4
Aster simplex	panicled aster	herb	FACW	3
Bidens cernua	nodding beggar-ticks	herb	OBL	2
Boltonia asteroides	false aster	herb	FACW	5
Chamaesyce humistrata	milk spurge	herb	FACW	1
Cyperus acuminatus	short-pointed flat sedge	herb	OBL	2
Cyperus strigosus	straw colored flatsedge	herb	FACW	0
Echinochloa muricata	barnyard grass	herb	OBL	0
Eupatorium serotinum	late boneset	herb	FAC+	1
Fraxinus pennsylvanica	green ash	shrub, h	FACW	2
Hibiscus lasiocarpus	hairy rose mallow	herb	FACW+	5
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lycopus americanus	common water horehound	herb	OBL	3
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Phalaris arundinacea	reed canary grass	herb	FACW+	*
Phragmites australis	common red reed	herb	FACW+	1
Phyla lanceolata	fog-fruit	herb	OBL	1
Platanus occidentalis	sycamore	herb	FACW	3
Polygonum lapathifolium	curttop lady's thumb	herb	FACW+	0
Polygonum pensylvanicum	giant smartweed	herb	FACW+	1
Populus deltoides	eastern cottonwood	shrub, h	FAC+	2
Salix exigua	sandbar willow	shrub	OBL	1
Salix nigra	black willow	herb	OBL	3
Setaria faberi	giant foxtail	herb	FACU+	*
Sium suave	water parsnip	herb	OBL	5
Typha angustifolia	narrow-leaved cattail	herb	OBL	*
Ulmus americana	American elm	herb	FACW-	5

†Coefficient of Conservatism (Taft *et al.* 1993); mean C value (mCv) = $\sum C/N = 64/28 = 2.3$
*Non-native species FQI = $\sum C/\sqrt{N} = 64/\sqrt{28} = 12.1$
key to abbreviations: sap = sapling, shr = shrub, h = herb, wdy vin = woody vine

ROUTINE ON-SITE WETLAND DETERMINATION

Site 3 (page 1 of 4)

Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Wet Shrubland
Legal Description: SE 1/4, NE 1/4, Sec. 25, T3N, R9W
Location: Covering most of the north quarter and part of the southwest quarter of the former Eckmann Property (Figure 1., #3 – B)

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
Populus deltoides	FAC+	shrub
Toxicodendron radicans	FAC+	herb
Leersia oryzoides	OBL	herb
Aster simplex	FACW	herb
Typha angustifolia	OBL	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%
Hydrophytic vegetation: Yes: X No:
Rationale: Over 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: NRCS mapped as Beaucoup silty clay loam; revised to Birds silt loam (Typic Fluvaquent)

On county hydric soils list?	Yes: X	No:	
Is the soil a histosol?	Yes:	No: X	
Histic epipedon present?	Yes:	No: X	
Redox concentrations:	Yes: X	No:	Color: 10YR 3/4, 7.5YR 4/6
Redox depletions:	Yes:	No: X	Color: NA

Matrix color: 2.5Y 3.5/
Other indicators: none
Hydric soils: Yes: X No:
Rationale: The Natural Resources Conservation Service identifies Birds as a Typic Fluvaquent which is poorly drained. This soil posesses redox concentrations within a gleyed matrix, which indicates saturated or reduced conditions for long duration during the growing season. Therefore, the soil at this site meets the hydric soil criterion.

ROUTINE ON-SITE WETLAND DETERMINATION

Site 3 (page 2 of 4)

Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Wet Shrubland
Legal Description: SE 1/4, NE 1/4, Sec. 25, T3N, R9W
Location: Covering most of the north quarter and part of the southwest quarter of the former Eckmann Property (Figure 1., #3 – B)

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: NA
Depth to saturated soil: 0.28 m (11 in)
Overview of hydrological flow through the system: This site receives water through precipitation and sheet flow from higher ground. Water leaves the site via evapotranspiration and sheet flow onto lower ground (site 1).
Size of watershed: < 2.6 km^2 (1 mi^2)
Other field evidence observed: none

Wetland hydrology: Yes: X No:
Rationale: The observation of saturated soil within 0.3 m (12 in) of the surface indicates that wetland hydrology is probably present. In our opinion, this site is flooded or saturated long enough to meet the wetland hydrology criterion. ISGS data (Ketterling and Robinson 2002) shows wetland hydrology.

DETERMINATION AND RATIONALE:

Is the site a wetland? Yes: X No:
Rationale for decision: Dominant hydrophytic vegetation, hydric soils, and wetland hydrology are all present. This site meets all of the wetland criteria. The NWI does not code this site as a wetland.

Determined by: Rick Larimore, Allen Plocher, David Ketzner,
& Paul Marcum (vegetation and hydrology)
Scott Wiesbrook (soils and hydrology)
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ROUTINE ON-SITE WETLAND DETERMINATION

Site 3 (page 3 of 4)

Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Wet Shrubland
Legal Description: SE 1/4, NE 1/4, Sec. 25, T3N, R9W
Location: Covering most of the north quarter and part of the southwest quarter of the former Eckmann Property (Figure 1., #3 – B)

SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C†
Acalypha rhomboidea	three-seeded mercury	herb	FACU	0
Agalinis tenuifolia	slender false foxglove	herb	FACW	5
Ambrosia trifida	giant ragweed	herb	FAC+	0
Ammannia coccinea	long-leaved ammannia	herb	OBL	5
Apocynum cannabinum	dogbane	herb	FAC	3
Asclepias incarnata	swamp milkweed	herb	OBL	4
Asclepias syriaca	common milkweed	herb	UPL	0
Aster simplex	panicled aster	herb	FACW	3
Bidens sp.	begger-ticks	herb	-	-
Boehmeria cylindrica	false nettle	herb	OBL	3
Boltonia asteroides	false aster	herb	FACW	5
Campsis radicans	trumpet creeper	shrub, h	FAC	2
Carex crus-corvi	sedge	herb	OBL	6
Carex hyalinolepis	sedge	herb	OBL	4
Carex lupulina	sedge	herb	OBL	5
Carex sp.	sedge	herb	-	-
Carex vulpinoidea	fox sedge	herb	OBL	2
Cynanchum laeve	blue vine	herb	FAC	1
Cyperus acuminatus	taperleaf flat sedge	herb	OBL	2
Cyperus esculentus	yellow nut-sedge	herb	FACW	0
Desmodium paniculatum	panicled tick trefoil	herb	FACU	2
Echinochloa muricata	barnyard grass	herb	OBL	0
Eleocharis erythropoda	red-rooted spikerush	herb	OBL	3
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Fraxinus pennsylvanica	green ash	tree	FACW	2
Hypericum punctatum	spotted St. Johns-wort	herb	FAC+	3
Ipomoea lacunosa	white morning-glory	herb	FACW	1
Iva annua	marsh elder	herb	FAC	0
Leersia oryzoides	rice cutgrass	herb	OBL	3

(continued)

ROUTINE ON-SITE WETLAND DETERMINATION

Site 3 (page 4 of 4)

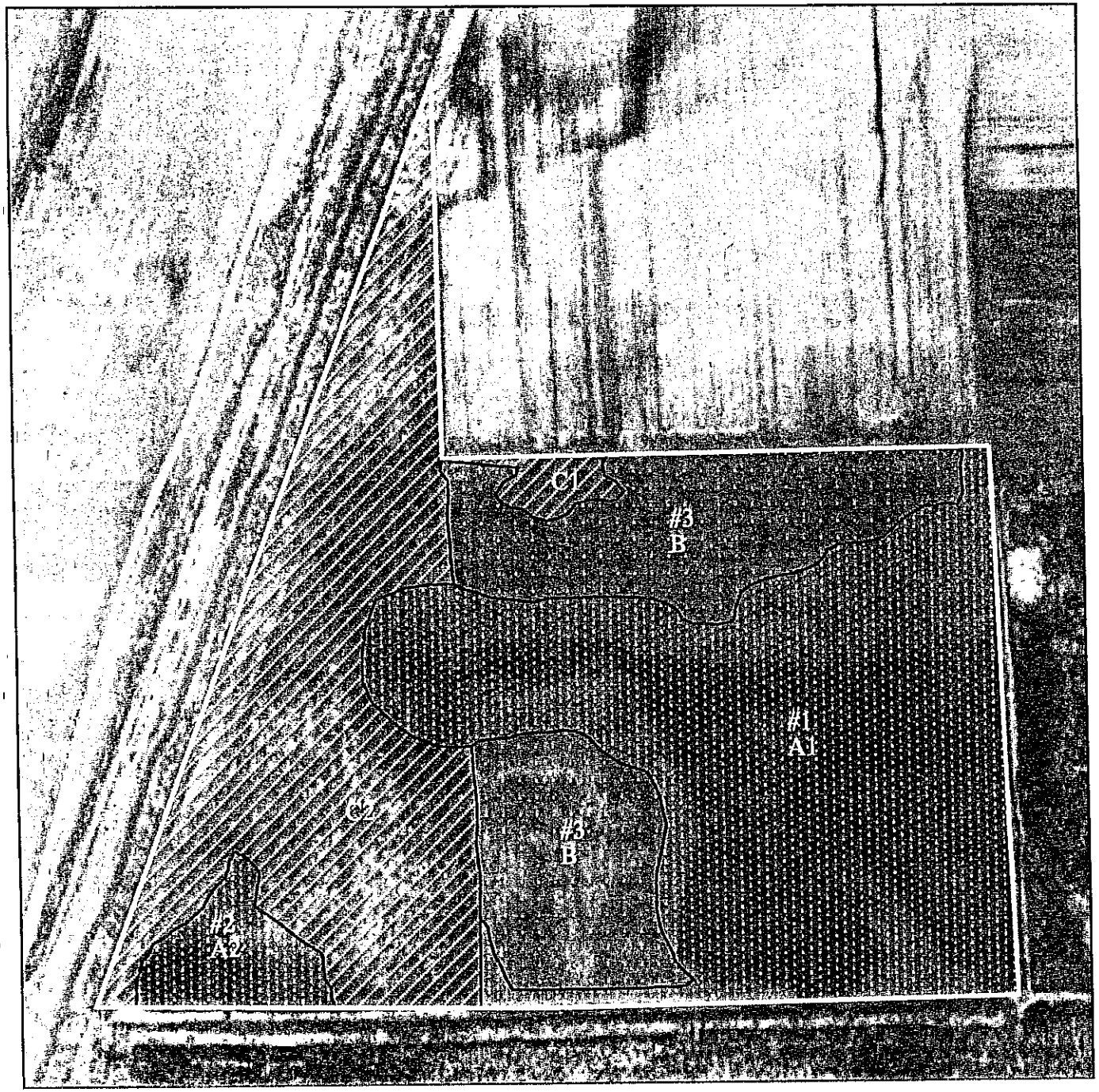
Field Investigators: Larimore, Plocher, Ketzner, Marcum, and Wiesbrook
Date: July 22, 2002
Project Name: Eckmann-Bischoff Property – FAP 14 (IL 3)
State: Illinois **County:** Madison
Applicant: IDOT District 8 **Site Name:** Wet Shrubland
Legal Description: SE 1/4, NE 1/4, Sec. 25, T3N, R9W
Location: Covering most of the north quarter and part of the southwest quarter of the former Eckmann Property (Figure 1., #3 – B)

SPECIES LIST (continued)

Scientific name	Common name	Stratum	Wetland indicator status	C†
Ludwigia polycarpa	false loosestrife	herb	OBL	5
Lycopus americanus	common water horehound	herb	OBL	3
Lythrum alatum	winged loosestrife	herb	OBL	5
Mimulus alatus	winged monkey flower	herb	OBL	6
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Phyla lanceolata	fog-fruit	herb	OBL	1
Populus deltoides	eastern cottonwood	sapling, shr, h	FAC+	2
Pycnanthemum tenuifolium	slender mountain mint	herb	FAC	4
Rumex crispus	curly dock	herb	FAC+	*
Salix amygdaloides	peach-leaved willow	shrub, h	FACW	4
Salix exigua	sandbar willow	shrub, h	OBL	1
Salix nigra	black willow	sapling, shr, h	OBL	3
Scirpus americanus	American bulrush	herb	OBL	3
Scirpus atrovirens	dark green rush	herb	OBL	4
Setaria faberi	giant foxtail	herb	FACU+	*
Setaria glauca	pigeon grass	herb	FAC	*
Solidago canadensis	Canada goldenrod	herb	FACU	1
Solidago gigantea	late goldenrod	herb	FACW	3
Stachys tenuifolia	slenderleaf betony	herb	OBL	5
Teucrium canadense	American germander	herb	FACW-	3
Toxicodendron radicans	poison ivy	shrub, h	FAC+	1
Typha angustifolia	narrow-leaved cattail	herb	OBL	*
Typha latifolia	cattail	herb	OBL	1
Ulmus americana	American elm	shrub, h	FACW-	5
Vitis cinerea	winter grape	woody vine, h	FACW-	4
Vitis riparia	riverbank grape	woody vine, h	FACW-	3
Xanthium strumarium	cockle bur	herb	FAC	0

†Coefficient of Conservatism (Taft *et al.* 1993); mean C value (mCv) = $\sum C/N = 137/50 = 2.7$
*Non-native species $FQI = \sum C/\sqrt{N} = 137/\sqrt{50} = 19.4$
key to abbreviations: sap = sapling, shr = shrub, h = herb, wdy vin = woody vine

Appendix 2
(Figures 1 - 5)



Vegetation Cover Type Mapping & Wetland Survey

Eckmann-Bischoff Property
FAP 14 (IL 3)
Section (64, 510)-1
P-98-082-90
Madison County, Illinois

Cover Types A-C

- Marsh (Types 1 & 2)
- Wet shrubland
- Forbland (Types 1 & 2)

Wetland Delineation Sites 1-3

Base photo is the Digital Orthophoto Quadrangle (DOQ) from NAPP 1998-1999 aerial photography.

N

0 50 100 150 Meters

Figure 1. Vegetation cover types at the Eckmann-Bischoff Property (Ketzner et al. 2001).

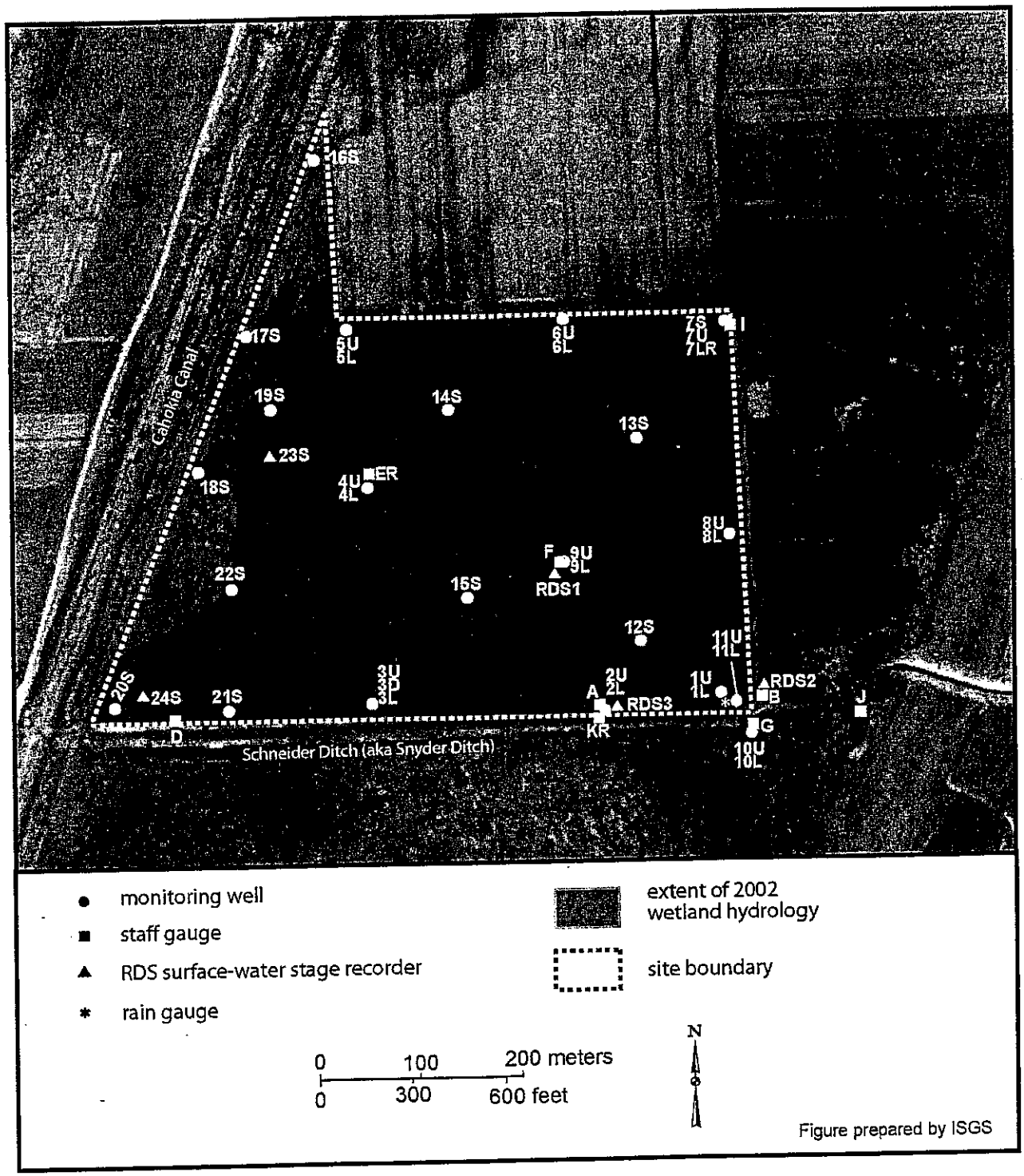


Figure 2. Estimated extent of 2002 wetland hydrology.

Figure 3. View to the west from Photo Station 1 showing Marsh (Type 1) and some Wet Shrubland to the far left.

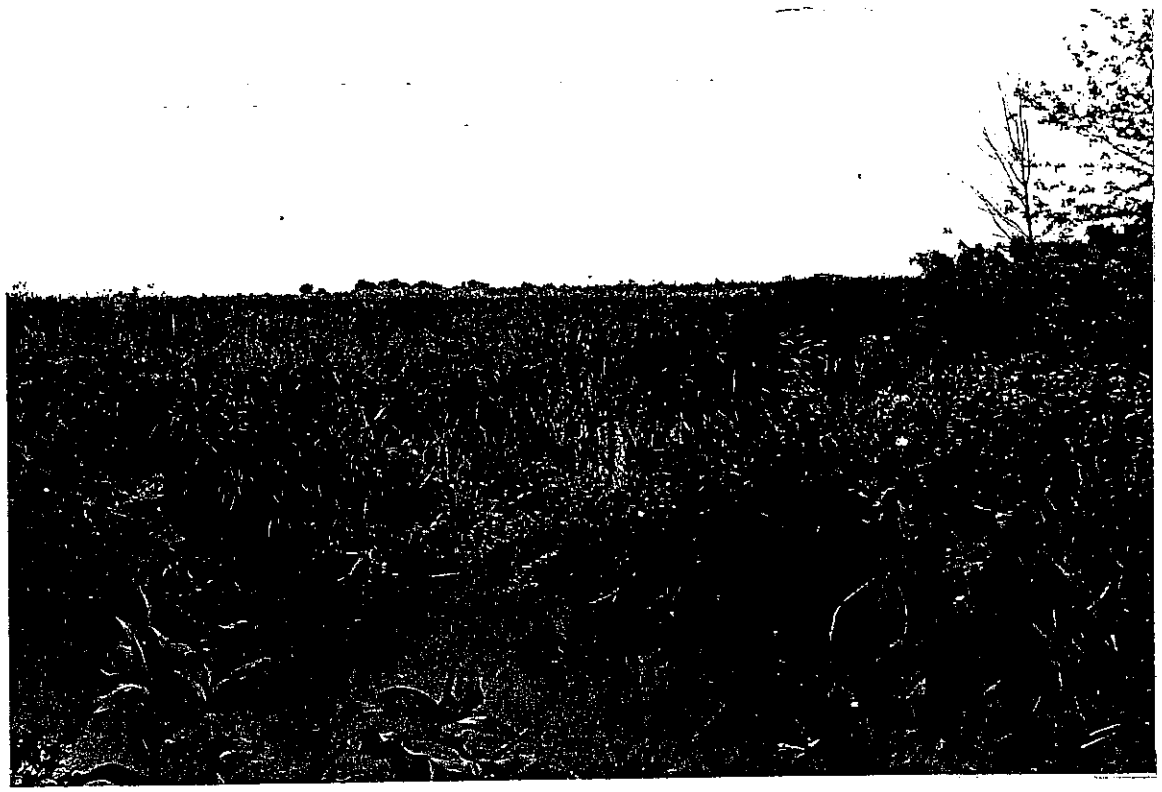


Figure 4. View to the northwest from Photo Station 2 showing Marsh (Type 1) and the ditch dug in the levee in the southeast corner of the project area.

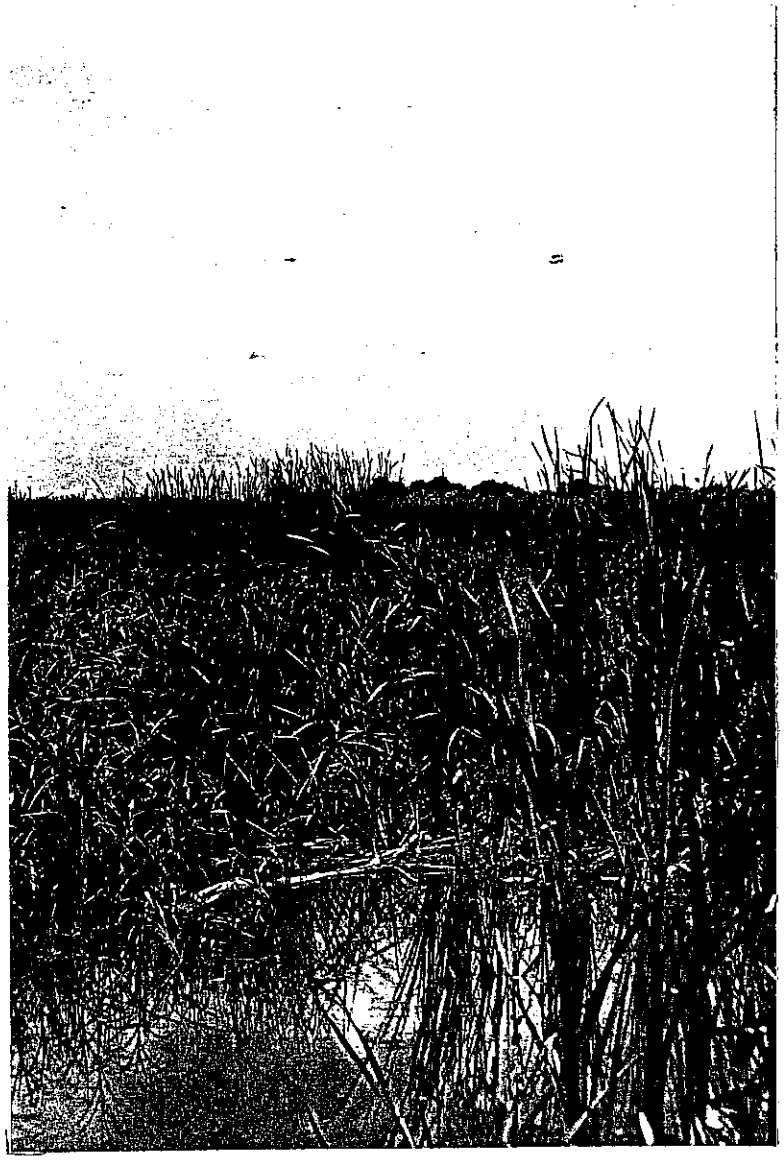


Figure 5. View to the northwest from Photo Station 1 showing close-up of Marsh (Type 1).