Wetland Mitigation Monitoring Report for the FAS 67 (Stagecoach Trail) site near the Galena River bridge, Jo Daviess County, Illinois

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Summary

Based on observations made during the 1999 season, the following is a summary that relates the likelihood that the compensation site will meet each goal within the five-year monitoring period. The goals, objectives, and performance standards follow those outlined in the IDOT monitoring request (16 March 1998)(EnCAP 1995).

Project goal: To create an herbaceous wetland and upland buffer on a 9.7-acre site.

Hydrophytic vegetation dominates throughout the wetland creation site, but hydric soils and wetland hydrology have yet to develop on much of the site. Vegetation that colonized the created site is dominated by native species. *Phalaris* and *Typha* control needs to be continued to meet project goals. Young willows may also have to be controlled in order to maintain the site as an herbaceous wetland. The buffer around the wetland contains a small number of planted trees, but the prairie seeds that were supposed to be planted were not installed.

Introduction

This report details the first year of monitoring of an excavated wetland created to mitigate for wetlands affected by the construction of the FAS 67 (Stagecoach Trail) bridge over the Galena River (Burton's Bridge)(legal location: NE/4, SE/4, sec. 16, T.28N., R.1E., Galena 7.5 minute quadrangle). The wetlands affected were located in the path of the new bridge corridor, south of the former bridge (Tessene and Harrold 1994). Earthwork for the mitigation site was completed in 1998, with the recommendation that topsoil be returned to the excavated area from the excavation and the affected wetlands in order to provide a medium for the growth of wetland plants and a possible seedbank. Plantings of herbaceous species consistent with the desired wetland vegetation were also established; plant cover in these established cells was monitored by Steve Lorig of Midwest Ecological Services, Inc., on September 14, 1999 (Lorig 1999).

This report discusses the goals, objectives, and performance criteria for the mitigation project, the methods used for monitoring the site, monitoring results, and discussion and recommendations. Methods and results are discussed for performance criteria for each goal.

Goals, Objectives, and Performance Criteria

The goals, objectives, and performance criteria described below follow those listed in the request to monitor the site (Tom Brooks, IDOT, 16 March 1998). Each goal should be attained by the end of a five-year monitoring period.

Project Goal 1: The created wetland community should be a jurisdictional wetland as defined by current federal standards.

Objective: The created wetland will be formed through excavation in a 9.7-acre former pasture, to compensate for wetland loss and degradation to approximately 3.5 acres of wetland, including 3.2 acres with good quality.

Performance criteria:
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 area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or be saturated to the surface for at least 12.5% of the growing season.

Project Goal 2: The created wetland community should meet standards for floristic composition and vegetation cover.

Objective: A sedge meadow/emergent wetland will be created by (1) returning topsoil from the excavation site and the wetlands affected by the bridge construction, (2) planting suitable wetland plants from available nursery stock, and (3) allowing natural colonization from the surrounding area.

Performance criteria:
a. Planted species survivorship: At the end of the five-year monitoring period, at least 50% of planted species will be living.
b. Native species abundance and cover: At the end of the five-year monitoring period, at least 75% of the area in the planned wetland should be covered by persistent hydrophytic vegetation. In the first year, percent coverage should be at least 15%. Native plants should be at least 50% of total species at the end of five years, at least 10% in the first year.
c. Dominant plant species: None of the three most dominant plant species in the planned wetland should be non-native species.

Project Goal 3: The buffer area around the constructed wetland should meet standards for floristic composition and vegetative cover.

Objective: Prairie vegetation will be established on the buffer around the wetland site. Trees will also be planted around the edges of the site nearest the bridge.

Performance criteria:
Native species abundance and cover: Native perennial, non-woody species will continue to be the predominant species in the prairie planting. Planted trees will show suitable survival.

Methods

Project Goal 1

a) Predominance of hydrophytic vegetation

The method for determining dominant hydrophytic vegetation at a wetland site is described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987), based on areal coverage estimates for individual plant species. Each of the dominant plant species is assigned its wetland indicator rating (Reed 1988). Plant species rated facultative or wetter (FAC, FAC+, FACW, or OBL) are considered hydrophytes. If more than 50% of the dominant species present are hydrophytic, this criterion of wetlands is met.

b) Occurrence of hydric soils

To monitor hydric soil development, the soil was sampled in 1999. Soil profile morphology, including horizon color, texture, and structure was analyzed at representative points throughout the site. Additionally, the presence, type, size, and abundance of redoximorphic features were recorded. In the absence of hydric soil indicators, hydrologic data can be used to confirm that conditions favorable for hydric soil formation persist at the site. (Environmental Laboratory 1987).

c) Presence of wetland hydrology

Indicators of wetland hydrology include, but are not limited to, drift lines, wetland drainage patterns, sediment deposits on leaves, watermarks on trees, and visual observation of inundated or saturated soils (Environmental Laboratory 1987). The Illinois State Geological Survey established monitoring wells only in September 1999, so data for water table depths were not available (Fucciolo *et al.* 1999). However, they did have records of observations of site inundation.

Project Goal 2

a) Planted species survivorship

Lorig (1999) assessed each of the 111 planting areas scattered throughout the site for the survival of planted species. He assigned numbers to each planting cell, determined total plant cover in each cell, assessed the general health of the planting beds, listed the planted species represented by living individuals, and estimated how many plants would be needed to restore each planting cell to its intended level of cover of 75%. Table 1 lists the 14 species planted at the wetland construction site in May 1999.

Table 1. Species planted in plant cells at the Galena River wetland creation site (from Lorig 1999).

Alisma plantago-aquatica
Asclepias incarnata
Calamagrostis canadensis
Carex comosa
Carex hystericina
Carex stricta
Carex vulpinoidea
Eupatorium maculatum
Iris versicolor
Juncus torreyi
Leersia oryzoides
Scipus validus
Scirpus cyperinus
Spartina pectinata

b) Native species abundance and cover, and
c) Dominant plant species

A complete survey of the excavated wetland basin was performed to tally all naturally occurring plant species present. Systematic plant sampling was also conducted during the survey of the site, using transects established at 25 m (82 ft) intervals parallel to the railroad tracks; 0.5 m^2 quadrats were placed at 25 m (82 ft) intervals along each transect. Cover of all species in each plot was assigned a cover class (Table 2) (Daubenmire 1959). Frequency (proportion of quadrats where a species occurred) and average cover (calculated using midpoints for each cover class) were 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 were averaged to determine the Importance Value for each species sampled.

Table 2. 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

Included with the assessment of a site is the site's Floristic Quality Index, as described by Swink and Wilhelm (1994) and Taft *et al.* (1997). Although the Index is not a substitute for quantitative vegetation analysis in assessing plant communities, it provides a measure of the floristic integrity or level of disturbance of a site. Each plant species native to Illinois is assigned a rating between 0 and 10 (the Coefficient of Conservatism) that is a subjective indicator of how likely a plant may be found 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. Species not native to Illinois are not rated.

To calculate the Floristic Quality Index (FQI), first compute the mean c value ($\bar{c}$), $\bar{c} = (\Sigma C)/N$, where ΣC represents the sum of the numerical ratings (c) for all species native to Illinois recorded for a site, and N represents the number of native species on the site. The c value for each species is shown in the species list for the site. The FQI of each site is determined by multiplying the mean c value by the square root of N ($\bar{c}\ \sqrt{N}$). An Index score below 10 suggests a site of low natural quality; below 5, a highly disturbed site. An FQI value of at least 20 ($\bar{c}$ above 3.0) suggests that a site has evidence of native character and may be considered an environmental asset.

Project Goal 3

Observations were made to determine whether prairie plants or seeds were installed in the buffer area. Planted trees were inventoried and assigned to species.

Results and discussion

Project goal 1

a) Predominance of hydrophytic vegetation

Dominant plant species for the created wetland are listed in Table 3. All of the dominant species are hydrophytic. A full list of plant species observed is presented in the wetland determination form at the end of this report (Appendix 1).

The herbaceous species that colonized the site are dominated by taxa that tolerate or even thrive under disturbed conditions, such as the original site excavation and periodic, prolonged inundation. *Amaranthus* and *Rumex* are weedy species; *Rumex* is non-native and is the fourth most

dominant species. *Salix* is a woody species that can become a tree; thus, its continued dominance will conflict with the project goal of the wetland site being dominated by herbaceous vegetation.

Table 3. Dominant plant species by stratum and wetland indicator status.

Dominant Plant Species	Indicator Status	Stratum
1. *Amaranthus tuberculatus*	OBL	herb
2. *Rorippa islandica*	OBL	herb
3. *Rumex crispus*	FAC+	herb
4. *Salix nigra*	OBL	herb

b) Presence of hydric soils

The USDA soil survey for Jo Daviess County (Tegeler 1996) indicates that Dorchester silt loam (occasionally flooded), a moderately well drained Typic Fluvaquent with a buried A horizon, is mapped for the northernmost portion of the site. Huntsville silt loam (frequently flooded), a well drained Cumulic Hapludoll, was mapped in the remainder of the site. Soil profile examination within the mitigation area revealed no evidence of the Dorchester silt loam. Features (Table 4a) generally coincided with the Huntsville series (very few redoximorphic features in the lower profile) except for a lower matrix chroma which may have developed in the past year when the site was saturated. Soil morphological features in the southern half of the site suggest that the soils there are wetter (Table 4b).

Soils appear to have been excavated approximately 0.6- 0.9 m (24–36 in). Based on morphological features in the lower profile (currently the upper 12 inches), the soils present at the site were moderately well drained to well drained. Currently, the soils do not exhibit redoximorphic features in the upper profile and cannot be considered hydric. However, at the time of the survey, two large portions of the site were inundated: one is fed by the ditch to the north and the other by the stream to the south. Hydrology at the site is favorable for the development of hydric soil characteristics and with time this may occur.

Table 4a. Profile description for north-central portion of FAS 67 wetland mitigation site.

0-10 in	C_1	10YR 4/2	silty clay loam, massive
10-13 in	C_2	2.5Y 4/2	silty clay loam, massive, few 2.5Y 5/2 iron depletions
13+			impenetrable (not bedrock)

Table 4b. Profile description, west-central, southwest, and southeast parts of wetland mitigation site.

0-4 in	BC	10YR 4/2	silty clay loam, subangular blocky to massive
4-12 in	C_1	2.5Y 4/1	silty clay loam, massive, few 10YR 4/3 iron masses
12-15 in	C_2	10YR 4/2 and 2.5Y 5/2	alternating layers of depositional strata, with 10YR 4/6 iron masses and clay skins on faces of peds
15+			impenetrable (not bedrock)

c) Presence of wetland hydrology

Field evidence of wetland hydrology included the excavated depressional landscape position, observation of areas containing shallow standing water (less than 0.1 m (3 in)), and saturated or moist soils over part of the site during a relatively dry period of the year. Well data were not available, but observations of site saturation and inundation in relation to monthly precipitation (Fucciolo *et al.* 1999) suggest that about 0.4 ha (1 acre) of the wetland basin conclusively meets the wetland hydrology criterion. Because of the widespread presence of moist to shallowly inundated soils, it is likely that wetland hydrology will eventually develop on much of the site.

Project Goal 2

a) Survival of planted herbs

Lorig (1999) observed an average 69.5% cover of planted species, ranging from 5% to 95% cover per planting cell. He did not calculate the cover for each species (noted in Table 1), but did note that most species appeared to be flourishing. *Calamagrostis canadensis* and *Scirpus cyperinus* were planted species that were not observed in the plots, and *Juncus torreyi* was only faring poorly. Since well over 50% (85.7%) of the planted species survived their first growing season, the performance standards for these plantings are met.

The planted species seem to be suitable for the site conditions, and generally desirable species. One possible exception may be *Iris versicolor*, a species native in the northern Midwest and in the northeastern United States and adjacent Canada, but not found in Illinois. Perhaps the plants are the closely related, native, *Iris shrevei* (*Iris virginica* var. *shrevei*) which also occurs in Wisconsin, where a number of nurseries that supply wetland plants are located. The best way to properly distinguish the two species is to observe them in bloom.

b) Abundance and cover of native species

During a survey of naturally occurring plant species on the wetland creation site, 36 native and 14 non-native species were observed (see Appendix 1). Therefore, 72% of the species are native to Illinois. Many non-native species were annuals or short-lived perennials growing near the perimeter of the site, and are expected to diminish in importance as site conditions stabilize. The FQI value for the site (unplanted species) was 13.3 with a mean C value of 2.2, indicating fair natural quality.

Vegetation sampling on the site (Table 5) included 26 species, including 20 native and 6 non-native species. Native species made up 77% of the number of species, 86.3% of relative frequency, 88.7% of relative cover, and 87.5% of importance values. All species except one can be considered hydrophytic. The exception, *Setaria*, a opportunistic species sometimes found in the drier parts of disturbed wetlands, occupied less than 1% of relative frequency and relative cover.

Bare areas were noted in 83.3% of quadrats, but averaged 19.4%. Hence, 80.6% cover of hydrophytic vegetation is present, meeting project standards. Annual species (11 of 26, or 42%) included 42.7% of relative frequency, 44.7% of relative cover, and 43.7% of importance values. These factors together suggest that the majority of the site is covered by persistent, perennial species, thus easily meeting performance standards for cover. Woody species (3 of 26) include 13.7% of relative frequency, 11.3% of relative cover, and 12.5% of importance values. The main contributor is *Salix nigra*, which will alter the long-term character of the site if many of the stems persist, for the site will eventually become a floodplain forest rather than an herbaceous wetland.

Table 5 below provides the results of vegetation sampling in the wetland creation site. Information provided includes percent frequency, relative frequency, average percent cover, relative cover, and importance value for each species. A list of all non-planted species observed in the wetland site is presented in Appendix 1.

Table 5. Results of vegetation sampling at the wetland creation site near the Galena River bridge.

Species	Freq.(%)	Rel.freq.(%)	Ave. Cover(%)	Rel. Cover(%)	IV
Salix nigra	52.8	16.24	21.65	20.84	18.54
Rorippa islandica	58.3	17.95	18.13	17.44	17.70
Amaranthus tuberculatus	27.8	8.55	9.04	8.70	8.62
Rumex crispus	27.8	8.55	6.07	5.84	7.19
Eleocharis erythropoda	13.9	4.27	6.60	6.35	5.31
Echinochloa muricata	13.9	4.27	5.97	5.75	5.01
Cyperus esculentus	16.7	5.13	4.74	4.56	4.84
Leersia oryzoides	13.9	4.27	5.28	5.08	4.68
Panicum dichotomiflorum	13.9	4.27	4.72	4.54	4.41
Populus deltoides	19.4	5.98	1.92	1.84	3.91
Rumex altissimus	11.1	3.42	3.54	3.41	3.41
Bidens cernua	8.3	2.56	3.82	3.68	3.12
Phalaris arundinacea	5.6	1.71	1.46	1.40	1.56
Carex trichocarpa	5.6	1.71	0.83	0.80	1.26
Carex sp.	5.6	1.71	0.83	0.80	1.26
Polygonum persicaria	2.8	0.85	1.74	1.67	1.26
Apocynum sibiricum	2.8	0.85	1.04	1.00	0.93
Atriplex patula	2.8	0.85	1.04	1.00	0.93
Carex vulpinoidea	2.8	0.85	1.04	1.00	0.93
Helenium autumnale	2.8	0.85	1.04	1.00	0.93
Polygonum hydropiper	2.8	0.85	1.04	1.00	0.93
Salix exigua	2.8	0.85	1.04	1.00	0.93
Bidens tripartita	2.8	0.85	0.42	0.40	0.63
Glyceria grandis	2.8	0.85	0.42	0.40	0.63
Setaria faberi	2.8	0.85	0.42	0.40	0.63
Panicum capillare	2.8	0.85	0.08	0.08	0.47
Total	325.0	100.00	103.92	100.00	100.00

c) Dominant plant species

The two most common species (Table 5 above), *Salix nigra* and *Rorippa islandica*, were much more frequent (over half of quadrats) and had more cover relative to other species. The next two species, *Amaranthus tuberculatus* and *Rumex crispus*, were present in about one-quarter of the plots. Other species were less important in the vegetation of the site. *Rumex* is non-native, but does not usually dominate sites unless highly disturbed (pers. obs.). *Amaranthus* and *Rorippa* are annuals, and would be expected to become less common as the site develops over time. (However, since Rorippa has a c value of 4, it is considered a desirable native species.) *Salix* may become more dominant as it grows, shading out understory species and changing the site from an herbaceous wetland to a floodplain forest.

Phalaris, *Typha*, and *Salix exigua* are present on the site, but are not dominants. Efforts to control these species have been ongoing, and need to continue. For long-term control of these species, it may be necessary to also control these aggressive species in neighboring wetland areas.

Project Goal 3

We observed no evidence to suggest that the prairie was planted in the buffer area around the wetland site. Soils appeared compacted, and the sparse vegetation was dominated by non-native weedy species. Vegetation should be established in the buffer area to decrease erosion and help filter runoff entering the wetland site.

We recorded 42 planted trees along the north and northeast parts of the buffer. Many appeared to be stressed, and some of these may not have survived the winter. Species present (and number of individuals encountered) included *Juglans nigra* (8), *Platanus occidentalis* (7), *Populus deltoides* (6), *Quercus bicolor* (9), *Q. palustris* (8), and *Ulmus americana* (4). The planted trees may need supplemental water in the coming year, especially if the weather remains dry.

Recommendations

Part of the excavated site may develop wetland conditions within five years, but none of the site had hydric soil at the time of this first-year survey, and wetland hydrology was conclusive only on one acre. The southwest corner and adjacent western border of the site appear least likely to develop the appropriate conditions, because they seemed to be at a slightly higher elevation and were drier than the rest of the site. The rest of the site was moist, saturated, or covered with shallow standing water at the time of our survey; thus it is likely that wetland conditions will develop over time, especially at the north edge and in the southeast part.

In general, unplanted species in the wetland basin are meeting performance standards. Most annual and non-native species will tend to decrease in cover as succession occurs on the site. The site currently meets criteria for vegetation cover (80%), the proportion of native species (72%), and native species dominance.

Overall planted herbaceous species cover (69%) in the wetland basin met performance standards, but some species and some individual planting cells should be replaced in order to increase plant species richness on the site. Of the planted species, 86% were represented by live individuals, thereby meeting project goals for planted species survival. The prairie buffer around the wetland site still needs to be planted. Planted trees in the buffer appeared stressed, and may require continued care.

Unplanted herbaceous species in the planned wetland basin are species that tolerate disturbance, as one might expect on a recently created site. *Typha* and *Phalaris* are present, and may come to pose a threat to a diverse herbaceous cover on the site; further monitoring and continued control are necessary. In the future, control efforts may need to expand into adjacent wetlands off the property where these species are common and can contribute propagules to the constructed wetland site. For instance, *Typha* is a dominant in a wetland east of the site (Appendix 2). This wetland, the former Site 2 in Tessene and Harrold (1994), contributes water to the constructed wetland site. *Phalaris* and *Salix exigua* are very common in a wetland southeast of the site across the stream (Appendix 3). Although both of these sites are degraded and are dominated by weedy species, they do contain some native species not found in the constructed wetland site, such as some sedges, *Lycopus americanus*, and *Hypericum pyramidatum*.

Salix nigra, a dominant species in the constructed wetland basin, may change the character of the mitigation site from an herbaceous wetland to a floodplain forest as it grows. Control of this species by weeding, mowing, herbicide use, or controlled burns may be necessary to maintain the site as an herbaceous wetland, if this continues to be the goal. (Postscript: in a conversation with Steve Lorig on April 18, 2000, he noted that Salix control will be attempted through mowing, and that *Phalaris* and *Typha* control continues through the use of herbicides. He also noted that the prairie border was planted in the fall of 1999.)

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Appendix 1
ROUTINE ONSITE WETLAND DETERMINATION
Site 1 (page 1 of 3)

Field Investigators: Tessene and Cooprider Date: 30 September 1999
Section No.: 88-00094-00-BR Project Name: FAS 67 (Stagecoach Trail)
State: Illinois County: Jo Daviess Applicant: IDOT District 2
Site name: Marsh
Legal Description: NE/4, SE/4, sec. 16, T.28N., R.1E.
Location: Excavated part of wetland restoration/creation site south of the bridge over the Galena River

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
1. *Amaranthus tuberculatus*	OBL	herb
2. *Rorippa islandica*	OBL	herb
3. *Rumex crispus*	FAC+	herb
4. *Salix nigra*	OBL	herb

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

SOILS
Series and phase: Undetermined
On Jo Daviess County hydric soils list? Yes: No: X
Is the soil a histosol? Yes: No: X Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: No: X Redox Depletions? Yes: No: X
Matrix color: 10YR 4/2
Other hydric soil indicators: Saturated soils in places
Hydric soils: Yes: No: X
Rationale: This soil lacks obvious redoximorphic features in the upper profile. This indicates that it is not saturated long enough for anaerobic conditions to occur in the upper profile.

HYDROLOGY
Inundated: Yes: No: X Depth of standing water: None
Depth to saturated soil: 0 to 0.6 m (24 in)
Overview of hydrologic flow through system: Precipitation and sheet flow contribute water to this site. Especially important are stream flow from a ditch leading from a spring northeast of the site, and overflow through an inlet connecting to a stream south of the site. Water leaves the site by evapotranspiration and drainage to the stream.
Size of watershed: Less than 2.6 km^2 (1.0 mi^2)
Other field evidence observed: This site is an excavated depression. We observed some areas that had shallow standing water (less than 0.1 m (3 in)) or saturated soils.
Wetland hydrology: Undetermined
Rationale: Low landscape position and the presence of inundated and saturated areas suggest that the site will develop wetland hydrology over time, but that indicators are not clear throughout the site at this time.

ROUTINE ONSITE WETLAND DETERMINATION

Site 1 (page 2 of 3)

Field Investigators: Tessene and Cooprider Date: 30 September 1999
Section No.: 88-00094-00-BR Project Name: FAS 67 (Stagecoach Trail)
State: Illinois County: Jo Daviess Applicant: IDOT District 2
Site name: Marsh
Legal Description: NE/4, SE/4, sec. 16, T.28N., R.1E.
Location: Excavated part of wetland restoration/creation site south of the bridge over the Galena River

WETLAND DETERMINATION AND RATIONALE

Is the site a wetland? Yes: No: X

Rationale: Although dominant hydrophytic vegetation is present, hydric soils are absent, and wetland hydrology is undetermined. However, the latter two factors may develop over time. The site is not included in the NWI.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland Indicator	C*
Abutilon theophrasti	velvetleaf	herb	FACU-	**
Alisma plantago-aquatica	water plantain	herb	OBL	2
Amaranthus tuberculatus	water hemp	herb	OBL	1
Ambrosia trifida	giant ragweed	herb	FAC+	0
Apocynum sibiricum	prairie dogbane	herb	FAC+	2
Artemesia biennis	biennial wormwood	herb	FACW-	**
Atriplex patula	orach	herb	FACW-	**
Bidens cernua	nodding bur-marigold	herb	OBL	2
Bidens frondosa	beggar's ticks	herb	FACW	1
Bidens tripartita	beggar's ticks	herb	FACW	2
Carex trichocarpa	sedge	herb	OBL	6
Carex vulpinoidea	fox sedge	herb	OBL	3
Carex sp.	sedge	herb	–	–
Cyperus esculentus	yellow nutsedge	herb	FACW	0
Datura stramonium	jimson weed	herb	UPL	**
Digitaria ischaemum	smooth crabgrass	herb	FACU	**
Echinochloa muricata	barnyard grass	herb	OBL	0
Eleocharis erythropoda	spikerush	herb	OBL	3
Erigeron annuus	daisy fleabane	herb	FAC-	1
Glechoma hederacea	creeping Charlie	herb	FACU	**
Glyceria grandis	tall manna grass	herb	OBL	10
Helenium autumnale	sneezeweed	herb	FACW+	3
Leersia oryzoides	rice cutgrass	herb	OBL	3
Mentha arvensis	field mint	herb	FACW	4
Mimulus ringens	monkey flower	herb	OBL	5
Panicum capillare	witchgrass	herb	FAC	0
Panicum dichotomiflorum	fall panic grass	herb	FACW-	0
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Phalaris arundinacea	reed canary grass	herb	FACW+	**

* Coefficient of Conservatism (see introduction)

** Species not native to Illinois

(Species list concludes on next page)

ROUTINE ONSITE WETLAND DETERMINATION

Site 1 (page 3 of 3)

Field Investigators: Tessene and Cooprider Date: 30 September 1999
Section No.: 88-00094-00-BR Project Name: FAS 67 (Stagecoach Trail)
State: Illinois County: Jo Daviess Applicant: IDOT District 2
Site name: Marsh
Legal Description: NE/4, SE/4, sec. 16, T.28N., R.1E.
Location: Excavated part of wetland restoration/creation site south of the bridge over the Galena River

SPECIES LIST (concluded)

Scientific name	Common name	Stratum	Wetland Indicator	C*
Polygonum aviculare	knotweed	herb	FAC-	**
Polygonum hydropiper	water pepper	herb	OBL	**
Polygonum lapathifolium	nodding smartweed	herb	FACW+	0
Polygonum pensylvanicum	smooth smartweed	herb	FACW+	1
Polygonum persicaria	lady's-thumb	herb	FACW	**
Populus deltoides	cottonwood	shrub, herb	FAC+	2
Portulaca oleracea	purslane	herb	FAC-	**
Ranunculus sceleratus	mud crowfoot	herb	OBL	3
Rorippa islandica	yellow marsh cress	herb	OBL	4
Rumex altissimus	pale dock	herb	FACW-	2
Rumex crispus	curly dock	herb	FAC+	**
Salix exigua	sandbar willow	shrub, herb	OBL	1
Salix nigra	black willow	shrub, herb	OBL	3
Sagittaria latifolia	common arrowhead	herb	OBL	4
Sambucus canadensis	elderberry	shrub, herb	FACW-	2
Scirpus validus	soft-stemmed bulrush	herb	OBL	4
Setaria faberi	giant foxtail	herb	FACU+	**
Solanum caroliniense	horse nettle	herb	FACU-	0
Solanum ptycanthum	black nightshade	herb	FACU-	0
Typha angustifolia	narrowleaf cattail	herb	OBL	**
Typha latifolia	common cattail	herb	OBL	1
Verbena urticifolia	white vervain	herb	FAC+	3

* Coefficient of Conservatism (see introduction)
Mean c value = $\Sigma C/N = 80/36 = 2.2$

** Species not native to Illinois
$FQI = \bar{C}\sqrt{N} = (2.2)\sqrt{36} = 13.3$

Determined by: Paul Tessene (vegetation and hydrology)
Mary Cooprider (soils and hydrology)
Illinois Natural History Survey
Center for Wildlife Ecology
607 East Peabody Drive
Champaign, Illinois 61820
(217) 244-7984, 333-6560

Appendix 2
Plant species observed in disturbed marsh east of the wetland mitigation site, September 1999

Scientific name	Common name	Stratum	Wetland Indicator	C*
Agrostis alba	redtop	herb	FACW	0
Ambrosia trifida	giant ragweed	herb	FAC+	0
Aster simplex	panicled aster	herb	FACW	3
Bidens cernua	nodding bur-marigold	herb	OBL	2
Carex trichocarpa	sedge	herb	OBL	6
Cyperus esculentus	yellow nutsedge	herb	FACW	0
Eleocharis erythropoda	spikerush	herb	OBL	3
Erechtites hieracifolia	fireweed	herb	FACU	2
Juncus dudleyi	rush	herb	FAC+	4
Mimulus ringens	monkey flower	herb	OBL	5
Polygonum amphibium	water smartweed	herb	OBL	3
Polygonum punctatum	dotted smartweed	herb	OBL	3
Ranunculus pensylvanicus	bristly buttercup	herb	OBL	5
Scirpus atrovirens	green bulrush	herb	OBL	4
Setaria faberi	giant foxtail	herb	FACU+	**
Setaria glauca	yellow foxtail	herb	FAC	**
Typha angustifolia	narrowleaf cattail	herb	OBL	**

* Coefficient of Conservatism (see introduction)
Mean c value = $\sum C/N = 40/14 = 2.9$

** Species not native to Illinois
$FQI = \bar{C}\sqrt{N} = (2.9)\sqrt{14} = 10.7$

Appendix 3
Plant species observed in disturbed wetland south of the wetland mitigation site, September 1999

Scientific name	Common name	Stratum	Wetland Indicator	C*
Acer negundo	box elder	sapling, shrub	FACW-	1
Agrostis alba	redtop	herb	FACW	0
Ambrosia trifida	giant ragweed	herb	FAC+	0
Bidens cernua	nodding bur-marigold	herb	OBL	2
Carex cristatella	sedge	herb	FACW+	3
Carex trichocarpa	sedge	herb	OBL	6
Carex vulpinoidea	fox sedge	herb	OBL	3
Hypericum pyramidatum	giant St. Johnswort	herb	FAC+	8
Juncus dudleyi	rush	herb	FAC+	4
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lycopus americanus	bugleweed	herb	OBL	3
Myosoton aquaticum	giant chickweed	herb	FAC+	**
Phalaris arundinacea	reed canary grass	herb	FACW+	**
Phleum pratense	timothy	herb	FACU	**
Poa pratensis	Kentucky bluegrass	herb	FAC-	**
Polygonum hydropiper	water pepper	herb	OBL	**
Salix exigua	sandbar willow	sapling, shrub	OBL	1
Sambucus canadensis	elderberry	shrub	FACW-	2
Solidago canadensis	Canada goldenrod	herb	FACU	1
Verbena urticifolia	white vervain	herb	FAC+	3

* Coefficient of Conservatism (see introduction)
Mean c value = $\sum C/N = 40/15 = 2.7$

** Species not native to Illinois
$FQI = \bar{C}\sqrt{N} = (2.7)\sqrt{15} = 10.3$