HABITAT MONITORING PROTOCOL FOR MARSH BIRD SURVEYS
DRAFT version 1.1, June 2009

Wetland Habitat Measurements (OPTIONAL)

Habitat monitoring is a critical component of marsh bird monitoring because the information can inform management and conservation actions. At this point, although we believe strongly that habitat monitoring should occur in conjunction with marsh bird surveys, we are suggesting that it is optional at this point because the protocol is still in draft form. The USFWS refuge staff, in working with Courtney Conway, provided guidance on habitat variables that should be collected to meet survey-specific objectives. This protocol suggests habitat variables to be measured during marsh bird surveys (see below for specific timeframe) that have the potential to link changes in bird numbers to changes in habitat characteristics.

Natural changes in water level and management activities (e.g., dredging, wetland restoration efforts, prescribed burning, etc.) can lead to dramatic changes in marsh conditions (i.e., vegetation, water level, substrate, etc). Patterns of distribution and local population trends of marsh birds can often be best explained by local changes in wetland vegetation. Consequently, quantifying the percent coverage by wetland plants and major vegetation types (e.g., % *Typha domingensis*, *Schoenoplectus pungens*, *Schoenoplectus californicus*, *Phragmites australis*, *Spartina foliosa*, *Salicornia virginica*, *Baccharis salicifolia*, *Tamarix ramosissima*, *Populus fremontii*, *Distichlis stricta*, *Pluchea sericea*, open water, mudflat) surrounding each survey point each year can help identify the causes of observed changes in marsh bird populations. Information on vegetation composition surrounding each point will allow one to: 1) extrapolate estimates of population density to total numbers of marsh birds within a given marshland, 2) correlate changes in marsh bird numbers with changes in habitat availability to help identify potential causes of observed population changes (Gibbs and Melvin 1993), 3) identify wetland plant communities that need protection, and 4) design management actions in ways that either improve or minimize adverse effects to preferred habitat of specific species of marsh birds.

The habitat features that surveyors should record include:

1) the National Wetland Inventory (NWI) classification at each survey point (http:/www.charttiff.com/pub/WetlandMaps/ Cowardin.pdf).

2) the *Ecological Classification System* from the National Vegetation Classification Standard (NVCS) for the area surrounding each survey point (see: http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol). In most cases, the ecological classification (i.e., Laurential-Acadian Freshwater Marsh) can be further identified to the Association level and surveyors are encouraged to record Association when possible (i.e., *Typha* spp. - *Schoenoplectus acutus* - Mixed Herbs Midwest Herbaceous Vegetation).

3) percent coverage of wetland plants within 50m of the survey point OR the dominant or co-dominant wetland plant species or genera at each survey point (list 1-3 dominant or co-dominant species). Hence, surveyors should visually estimate the percent coverage by each wetland plant and each major vegetation type within a 50m-radius circle surrounding each survey point. The list of species and genera from which to choose is based on the U.S. Department of Agriculture's "PLANTS" database. When possible, participants should use the first option above. As an example, visual estimates of percent coverage of each wetland plant and vegetation type at a survey point might look like this: 15% water, 10% *Schoenoplectus californicus*, 20% *Schoenoplectus pungens*, 5% *Typha domingensis*, 20% *Baccharis salicifolia*, 10% mudflat, 20% upland shrub community.

Record percent coverage to the species level because some marsh birds preferentially use only one species of emergent plant. If participants are conducting surveys in areas with a diversity of wetland plant species and identifying all species is logistically not possible, then they should at least record the 1-3 dominant or co-dominant species. "Dominant" is defined as any plant species that comprises >25% of the vegetative cover within a 50-m radius of the survey point. Surveyors should list the 1-3 dominant species at each survey point in decreasing order of abundance. Percent plant coverage (or list of dominant plants) at each point is only recorded once each year. These data should be entered into the Marsh Bird Database.

In some locations, annual growth of wetland plants changes dramatically as the season progresses. Surveyors should estimate percent coverage of wetland plants at a time that overlaps the breeding season for all of their target marsh birds. Estimate percent coverage of wetland plants at a time when you are most likely to detect important changes in vegetation 5 or 10 years later (changes that might help explain increases or decreases in number of marsh birds detected). If the vegetation doesn't change during the annual survey period, surveyors should consider quantifying percent coverage of vegetation within the 50-m radius circles during their final survey each year, if doing so does not interfere with or compromise data collection on the marsh birds themselves. However, **vegetation data does not have to be collected while the vocal survey is being conducted** (it might be most effective, and least disruptive to the bird survey, to make a separate trip to each survey point to collect vegetation data). Regardless of when surveyors choose to estimate percent coverage, they should be sure to estimate percent coverage at that same time each year.

Surveyors should enlist the help of a botanist or other qualified assistance to identify plant species if necessary. Differentiating plants by species is difficult in some taxa and not all surveyors will be able to consult with a botanist prior to estimating percent coverage at each of their survey points. In these cases, surveyors can pool species by taxa or functional group (e.g., sedge spp., bulrush spp., mixed shrub). If the vegetation changes substantially at a particular point during the course of a single survey season, surveyors should make a note in the *Comments* column of the Marsh Bird datasheet (and on the vegetation data form if you have one) stating how the vegetation has changed over the course of the season. Surveyors should estimate percent coverage

at all points each year (even if no emergent vegetation currently exists at some points during some years) to document changes over time in habitat availability. Because most survey points will be at the marsh/upland or marsh/open-water interface, approximately half of the 50-m radius circle within which you record percent coverage might be “upland vegetation". There is no need to characterize upland vegetation by species. Hence, include categories in your vegetation classification called "upland vegetation", “road”, and "open water" if appropriate. There may be some points that are on peninsulas or in narrow open water channels (surveyed by boat) and these points may have emergent marsh within most of the 50-m radius circle. For example:

A) Picture a circle that is 60% upland, and 15% each of 2 wetland plants. Then picture a peninsula of land that is 5% upland, and 48% each of those same 2 wetland plants.

B) Picture a strip on a lake that is 90% open water and 5% each of 2 wetland plants. Then picture that same point 5 years later that is 10% open water and 45% each of those same 2 wetlands plants.

Suggested habitat variables to be measured are summarized in Table 1 to coincide with potential objectives for marsh bird monitoring program. The objectives could be:

Presence/Absence/Distribution: *Are marshbirds using my refuge and where are they?*
Population Trend: *What is the change in marsh bird numbers over a time period?*
Management Actions: *What are the effects of management actions on marsh bird numbers?*

Table 1. Three objectives for marsh bird monitoring and possible associated habitat variables that should be recorded during surveys. Variables that have not been discussed in this section and require reference or further discussion are defined below the table.

VARIABLES*	**OBJECTIVES**		
	Presence/Absence/ Distribution:	**Population Trend**	**Management Actions**
CLASSIFICATION & DISTURBANCE			
Edge Type	X	X	X
Land Use	X	X	X
NWI Code	X	X	X
Ecological Classification System	X	X	X
NVCS Alliance	X	X	X
Most Dominant Plant Species or % Species Composition	X		X
Disturbance (see below)		X	X
HABITAT CHARACTERISTICS			
Wetland Perimeter	X	X	X
Wetland Interspersion	X	X	X
Daily Tidal Flux			X

Density (rank, mod., sparse)			X
Estimated Marsh Veg. Height			X
Litter Depth (cm)			X
Wetland Cover Class	X	X	
Water Depth	X	X	X
Water Measurement Method	X	X	X
DISTANCE TO PHYSICAL CHARACTERISTICS			
Eight Variables			X

*DEFINITIONS:

Classification and Disturbance

Edge Type:
Select the local context of each point using the list provided in the *Location of Survey Points* section.

Land Use:
Select the primary use of the land surrounding the wetland. Choose one of the following – pasture, hayfield, idle, burned, row crop, small grain crop, unknown crop, tilled, fallow, other. *This measurement may be specific to the Prairie Pothole Region, but if it is appropriate and possible to record in your area, then please record. Further efforts to look into this variable is needed.*

Disturbance: Fire, ice damage, insect damage, road construction, selective harvest, trail construction, blow down/wind event, other (record on line….)

Habitat Characteristics

Wetland Perimeter: (If you are surveying within a wetland basin where the size (e.g., very large) precludes you from estimating this parameter, then leave blank.

This is an important variable to record because there are indications from other studies that some birds may avoid wetlands with certain types of perimeter. Using percentage categories (<5%, 6-25%, 26-50%, 51-75%, >75%), record the percent of shrubs, trees, herbaceous and bare soil for the perimeter of the entire wetland basin.

Wetland Interspersion:
Interspersion is the mosaic of vegetated and open water elements. It is derived by determining the percent cover of open water, upland, mudflat and floating vegetation, within a 50m radius around the survey point. This measure is redundant IF % cover is recorded and not most 3-dominant species (see #3 above).

Daily Tidal Flux:

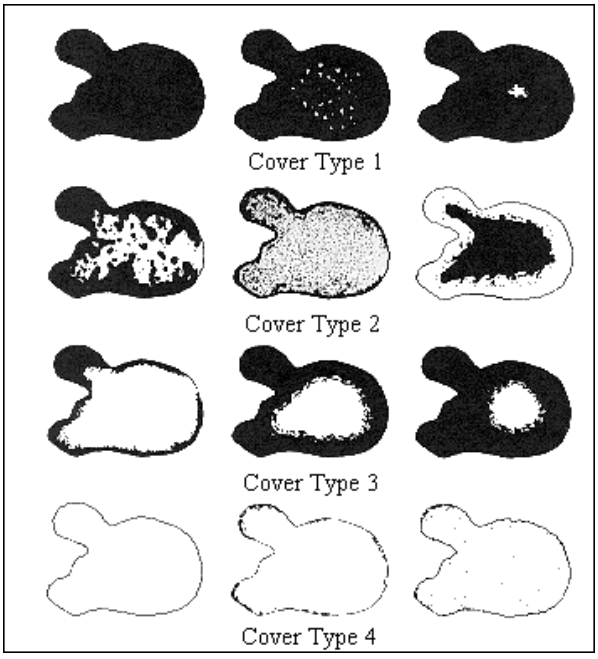
Water Depth: this variable could be challenging to collect because of the time involved. Some options to obtain water depth are:

a. Place water gauge at a representative number of survey points; not necessary to have water gauge at every point.
b. Obtain an average water depth in the wetland unit by randomly measuring approximately 15-20 points and at the same time, take a reading from the staff gauge, if available (the permanent one in the wetland). You only need to obtain the average water depth only once. On subsequent surveys, you only need to record the water level at the staff gauge and be able to relate it back to average wetland depth.
c. Place a water gauge at the survey point for more site specific readings.
d. Record water level during each survey.

Water Measurement Method: staff gauge, water gauge at water control structure, meter stick at site, other.

Wetland Cover Class: If you are surveying within a wetland basin where the size (e.g., very large) precludes you from estimating this parameter, then leave blank.

(Stewart and Kantrud (1971) defined wetland cover types using the placement of emergents within the wetland as shown below).



Cover type 1. Closed stands of emergent vegetation with open water or bare soil covering <5% of the wetland area.

Cover type 2. Open water or bare soil covering 5 – 95% of the wetland, with scattered dense patches or diffuse open stands of emergent cover. Also includes closed stands of emergent vegetation, located in the center and surrounded by open water.

Cover type 3. Central expanses of open water or bare soil (>5% of the wetland area) surrounded by peripheral bands of emergent cover averaging 6 feet or more in width.

Cover type 4. Open water or bare soil covers > 95% of the wetland area. Also includes small ponds in which emergent cover is restricted to marginal bands <6 feet in average width.

Density: To the best of your abilities, estimate the density category of vegetation within 50 m around the survey point:

1-rank = water not visible through base of stems at water level and you cannot easily push hand through the stems
2-moderate = anything that falls between these two extremes
3-sparse = water easily visible through base of widely scattered stems

Distance to Physical Characteristics:
In order to further refine the context of the survey point within the surrounding landscape, record the estimated distance to the following physical characteristics: water edge, edge of vegetation (shrub, trees, herbaceous), ditch, mudflat, road or dike, upland area, large open water, small open water.