Appendix G:
Modifications to the Wetland SOP and Data Sheets for Field Work from September 21 through 30, 2007

September 21, 2007

This document describes modifications made, with approval of MA-DEP and US-EPA, to modify the field data collection for the later part of September to shift the emphasis of our wetlands field work toward the condition assessment and postpone much of the characterization component until 2008.

Rationale

The delayed start of the field season made it difficult to meet the expectations established in June when this project began. The delay was due in part to the necessity of preparing a QAPP for the project, but is also due to the time required to identify and hire qualified staff (graduate student and technicians), develop the research concepts sufficiently to yield field protocols, and the procuring of equipment and supplies. As a result UMass proposed changes to the field data collection for the later part of September in order to get the most out of the 2007 field season.

This proposal, to shift the emphasis of our wetlands field work toward the condition assessment and postpone much of the characterization component until 2008, was approved by both MA-DEP and US-EPA.

The advantages:

- Provides an opportunity to better think through what is needed from the characterization component and develop a Wetland SOP for 2008 that is well targeted and efficient
- Provides more time to get field people trained/more familiar with plant ID, soil characterization and field techniques
- Focusing solely on condition assessment will be quicker to implement and improves the likelihood of getting to 60 sites needed to create a draft RAM over the winter

The condition assessment component of the SOP is pretty straight-forward and does not take very long to implement. The characterization component, however, requires more detailed evaluations of soils, hydrology and vegetation. These characterizations take much more time to conduct in the field and require more time for field staff to gain experience with soils and vegetation assessment.

The late start has also made it very difficult to get to 60 sites in this field season. Whereas the characterization work can easily be picked up next year with without upsetting overall time line for the project, it is necessary to collect condition data on as many sites as possible in 2007 so that we can construct a RAM for testing in 2008. Therefore, it was decided that for the balance of the 2007 field season (September 21-30) the focus of field work would shift to condition assessment and that much of the wetlands characterization work needed to test the new CAPS approach for characterizing the landscape using ecological gradients instead of more traditional community classification would be postponed to 2008.

This change would have no affect on the field work necessary for creating a draft RAM (condition assessment). In fact, this proposal will free up time needed to conduct condition assessments at as many sites as possible (hopefully 60 total) so that it will be possible to draft a reasonable RAM for testing in phase 2 (2008). This proposal will not affect the timeline in the QAPP for any of the components listed in Table 1.1. It was expected all along that two field seasons would be needed to complete the wetlands characterization work before we could adequate test the CAPS approach (currently scheduled for completion on December 31, 2008). This proposal also would not affect the budgeting or timeline for phase 1 or phase 2 funding.

Description of the Modifications

Rather than eliminate all the characterization it will be significantly scaled it back. Instead of detailed evaluations of hydrology, soils and vegetation, only very general information about vegetation will be collected (%cover in each strata and three most dominant plant species per strata) but without the use of sub-plots. In addition we will continue to collect information on wetland classification (HGM, Cowardin). Here is a summary of how the wetlands characterization work changed relative to sections 2.1 and 2.2 of the QAPP and the Wetlands SOP.

	Original Approach	**Revised field protocol**
Location	GPS	No change
HGM Classification	Yes	No change
Cowardin classification	Yes	No change
Hydrology	Percent cover surface water, average depth of surface water, depth to groundwater, sheet or channelized flow	This component will be dropped
Water geochemistry	pH, temperature, conductivity	This component will be dropped
Soils	Horizon depth/thickness, matrix color, percent redoximorphic features, color of redoximorphic features	This component will be dropped
Topographic complexity	Transitions, hummocks per distance (along transect lines)	This component will be dropped
Vegetation	Use of sub-plots along transects to estimate percent cover for each vegetative strata; within each vegetative strata percent cover for all plant species with a percent cover of 10% or more	Use of sub-plots will be dropped. Percent cover for each vegetative strata will be estimated; up to three of the most dominant plant species (percent dominance ≥ 20%) will be recorded for each strata

Section 8: Procedures of the "Standard Operating Procedures: Assessment of Wetland Communities" (Appendix C)

Following are the affected sub-sections within Section 8: Procedures, modified to reflect the changes discussed above (sub-sections not listed below remain unchanged).

8.2 Overview of Characterization and Condition

Each plot will be characterized using the HGM (Brinson, 1993) and the Cowardin classification (Cowardin et al., 1978) methods, and by vegetative characteristics. Characterization will be assessed in sample plot 1(AA1). Condition of the wetland will be determined using indicators of altered hydrology, altered plant community, altered soils, water pollution, and human disturbance in sample plot 2 (AA2). The 30.5m (100 ft) buffer zone will also be assessed for condition using indicators of altered plant community, soils, and human disturbance. Variables used for characterization and condition assessment will be independently recorded on field data sheets (or Palm-style computers) to facilitate evaluation of each variable for potential use in the RAM.

8.3 Hydrology

Hydrology is a fundamental component of a wetland system and will be used to assess the condition of the assessment areas. HGM and Cowardin hydrologic classification will be used to characterize the hydrology of AA1. Indicators of altered hydrology will include the presence of water control structures (dam, weir, culvert, fill, ditching, channelization, beaver dam, storm water inputs) upstream, downstream, and within AA2. These will be used to assess the hydrologic condition of the AA2.

From the center point of the plot walk four 50m transects and make visual observations of the following within AA2 and record them on field data forms.

a. Determine if any water control structures are present within AA2 and indicate type: culvert, dam, weir, storm water input, fill (road/railroad), ditching, channelization, beaver dam, other.

b. From central plot point walk a minimum of 100 m up and down gradient of AA2 to look for water control structures. Follow any stream channel that has the greatest impact to the wetland. Indicate type of any control structures found.

c. Determine the net effect of all water control structures on the hydrology of AA2 based on structures found within and outside the plot. Indicate if AA2 is unlikely, some-what likely, likely, or definitely affected by the water control structures, and whether it is drier or wetter as a result.

   If AA2 is definitely, some-what likely, or likely to be impacted by water control structures, indicate the percent of AA2 impacted.

8.4 Vegetation

The total percent cover for major vegetation classes and up to three dominant plant species will be used to characterize wetland vegetation. Whenever possible plants will be identified to the species level; if that is not possible they will be identified by genus or other taxonomic grouping (e.g. unknown

grass). Invasive species richness and percent cover, evidence of mowing and/or burning will be determined as indicators of plant community condition. Invasive species include species that have been identified by the Massachusetts Invasive Plant Advisory Group as “invasive”, likely invasive”, or “potentially invasive” (http://www.massnrc.org/MIPAG/index.htm).

From the center point of the plot walk four 30m transects and make visual observations of the vegetation within AA1.

a. Determine the total percent cover of each major vegetation class (trees, shrubs, climbing woody vines, ground cover)

b. Identify and record up to three of the most dominant species in each vegetative layer with a percent dominance of ≥ 20%. If identification of vegetation can not be determined in the field, take a sample and photo of the plant, and make a note on the data sheet. Label plastic bag with photo ID number, date, plot ID, transect bearing, and name of the person collecting the sample

From the center point of the plot walk four 50m transects and spend an additional 20 minutes walking the rest of the plot and make visual observations of the following within AA2.

a. Identify all invasive plant species that can be seen from the transect line and found during the 20 minute walk around AA2.

b. Estimate percent cover using the line intercept method and assign a cover class for each invasive species. Take samples and pictures of plants that can not be identified and are suspected to be invasive. Make a note on the data sheet. Label plastic bag with photo ID number, date, plant ID, plot ID, date and name of the person collecting the sample.

c. Indicate the percent of AA2 that shows evidence of mowing, burning, or timber harvesting using the following categories: absent, <10%, 10-50%, 50-90%, >90%. Make a note on the data sheet if the vegetation management is likely to be part of an ecological restoration project.

8.5 Soils

Indicators of altered soils will be assessed for the condition of AA2.

Walk four 50m transects and determine the percent of AA2 that is disturbed by each of the following.

a. Filling,
b. Plowing,
c. Grading,
d. Grazing,
e. Dredging,
f. Sedimentation,
g. Vehicle use.

Take a photo of any disturbance and record photo ID number and transect on data sheet.

8.6 Topographic complexity

Dropped.

8.7 Water Geochemistry

Turbidity and indicators of water pollution (obvious spills, excessive algae, and sediment plumes from point source discharges) will be used to assess the condition of AA2. Massachusetts Water Quality Standards for surface water will be used as a reference for interpreting turbidity data.

Turbidity of surface water (if present) will be measured at five locations within AA2. Turbidity will be assessed at the central plot point and at the midpoint (or the closest point with standing water within 20m of the midpoint of the four 50 m transects.

From the center point of the plot walk six 50m transects and make visual observations of the following within AA2.

a. Obvious spills. Determine presence or absence. If present indicate percent of the AA2 that is affected: <10%, 10-50%, 50-90%, >90%.

b. Excessive algae. Determine presence or absence. If present indicate the percent of the AA affected: <10%, 10-50%, 50-90%, >90%. Record on data sheet.

c. Direct point or nonpoint source discharge from agricultural operations, septic or sewage treatment systems, or storm water. Indicate if such discharges are present and the percent of AA2 that is directly affected by discharges from each source: <10%, 10-50%, 50-90%, >90%.

Modified Field Data Forms

Following are the revised field data forms used for this modified approach.

Form 1: MA Freshwater Wetland Assessment

Surveyors:		Date:
Watershed:	Point ID:	GPS ID:
HGM Classification:		Cowardin Classification:
Class		Class
Subclass		Water Regimes
		Modifiers
Start Time:		Finish Time:
Comments:		
Sketch the AA:		

Vegetation Characterization

List the dominant vegetation for each stratum within the condition assessment area (radius=30m). Include up to 3 species that have >/= 20% dominance.

Trees	Shrubs

Herbaceous	Aquatic Floating

Aquatic Submergent	Comments:

List the % cover for each vegetative stratum.

Trees	□0%	□ 1-5%	□6-15%	□16-25%	□26-50%	□51-75%	□76-95%	□96-100%
Shrubs	□0%	□ 1-5%	□6-15%	□16-25%	□26-50%	□51-75%	□76-95%	□96-100%
Herbaceous	□0%	□ 1-5%	□6-15%	□16-25%	□26-50%	□51-75%	□76-95%	□96-100%
Aquatic Floating	□0%	□ 1-5%	□6-15%	□16-25%	□26-50%	□51-75%	□76-95%	□96-100%
Aquatic Submergent	□0%	□ 1-5%	□6-15%	□16-25%	□26-50%	□51-75%	□76-95%	□96-100%

List all invasive species that are in the AA (radius=50m) that did not intercept the transect line, and indicate if they are >5% of the wetland. Determine after walking all transect lines.

Comments:

Human Disturbance

Indicate if motorized or non-motorized vehicle is present in AA. Estimate linear m of trail.

□ None _____	□ Walking trail _____	□ ATV trail _____	□ Logging Road _____
□ Horse trail _____	□ Old Cart Path _____	□ Roads _____	□ Other _____

Comments:

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Human Disturbance

Check if present and indicate the % of AA that is affected.

□ Trash/litter (recent or historic)	□ <10%	□ 10-50%	□ 50-90%	□ >90%
□ Garbage dumping (recent or historic)	□ <10%	□ 10-50%	□ 50-90%	□ >90%
□ Evidence of mowing	□ <10%	□ 10-50%	□ 50-90%	□ >90%
□ Evidence of burning	□ <10%	□ 10-50%	□ 50-90%	□ >90%
□ Hay/pasture	□ <10%	□ 10-50%	□ 50-90%	□ >90%
□ Row crop	□ <10%	□ 10-50%	□ 50-90%	□ >90%
□ Impervious	□ <10%	□ 10-50%	□ 50-90%	□ >90%
□ Other	□ <10%	□ 10-50%	□ 50-90%	□ >90%

Comments:

Hydrologic Condition

Indicate if there are water control structures present in the AA. Check all that apply.

□ Storm water inputs	□ Dam	□ Culvert	□ Weir
□ Channelization	□ Beaver Dam	□ Ditching	□ Fill (road/railroad)
□ Other			

Comments:

Indicate if there are water control structures up and down gradient from the AA. (Walk a minimum of 100m of the channel that has the greatest impact to the wetland) Check all that apply.

□ Storm water inputs	□ Dam	□ Culvert	□ Weir
□ Channelization	□ Beaver Dam	□ Ditching	□ Fill (road/railroad)
□ Other			

Comments:

Indicate the net affect of any control structures present on the hydrology of the AA.

Wetter	□ Unlikely	□ Some-what likely	□ Likely	□ Definite
Drier	□ Unlikely	□ Some-what likely	□ Likely	□ Definite

Comments:

If Definite, Some-what likely or Likely, indicate the degree of impact (% of AA) the structure has on the AA?

□ <10%	□ 10-50%	□ 50-90%	□ >90%

Comments:

MA Freshwater Wetland Assessment

Transect Data: N E S W **Transect Length:**

Invasive Species

Record the percent cover of invasive species along the 50m transect line or otherwise noted.

Species	% Cover	Species	% Cover

Comments:

Buffer Zone Condition

Assess the 30.5m buffer zone of the AA. Break up the buffer into 3 zones: inner 7.6m, middle 7.6m, outer 15m.

Indicate the number of point source discharges in the buffer zones

	Inner	Middle	Outer
# of discharges			

Comments:

Indicate if there is evidence of erosion & sedimentation in the buffer zones. If present indicate the extent of the area impacted.

Inner	□ <10%	□ 10-50%	□ 50-90%	□ >90%
Middle	□ <10%	□ 10-50%	□ 50-90%	□ >90%
Outer	□ <10%	□ 10-50%	□ 50-90%	□ >90%

Comments:

Check if the following conditions are present in each zone. If present, indicate the % of the zone that is in that condition.

Condition	Inner		Middle		Outer	
Mowed turf	□ <10%	□ 10-50%	□ <10%	□ 10-50%	□ <10%	□ 10-50%
	□ 50-90%	□ >90%	□ 50-90%	□ >90%	□ 50-90%	□ >90%
Hay/pasture	□ <10%	□ 10-50%	□ <10%	□ 10-50%	□ <10%	□ 10-50%
	□ 50-90%	□ >90%	□ 50-90%	□ >90%	□ 50-90%	□ >90%
Row crop	□ <10%	□ 10-50%	□ <10%	□ 10-50%	□ <10%	□ 10-50%
	□ 50-90%	□ >90%	□ 50-90%	□ >90%	□ 50-90%	□ >90%
Impervious	□ <10%	□ 10-50%	□ <10%	□ 10-50%	□ <10%	□ 10-50%
	□ 50-90%	□ >90%	□ 50-90%	□ >90%	□ 50-90%	□ >90%
Subject to vegetation management	□ <10%	□ 10-50%	□ <10%	□ 10-50%	□ <10%	□ 10-50%
	□ 50-90%	□ >90%	□ 50-90%	□ >90%	□ 50-90%	□ >90%
Logging road	□ <10%	□ 10-50%	□ <10%	□ 10-50%	□ <10%	□ 10-50%
	□ 50-90%	□ >90%	□ 50-90%	□ >90%	□ 50-90%	□ >90%
Natural	□ <10%	□ 10-50%	□ <10%	□ 10-50%	□ <10%	□ 10-50%
	□ 50-90%	□ >90%	□ 50-90%	□ >90%	□ 50-90%	□ >90%

Comments:

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Buffer Zone Condition

Check if present and indicate the % of the zone that is affected by the following.

Condition	Inner		Middle		Outer	
Trash/litter	□ <10%	□ 10-50%	□ <10%	□ 10-50%	□ <10%	□ 10-50%
	□ 50-90%	□ >90%	□ 50-90%	□ >90%	□ 50-90%	□ >90%
Garbage dumping Circle: historic/recent	□ <10%	□ 10-50%	□ <10%	□ 10-50%	□ <10%	□ 10-50%
	□ 50-90%	□ >90%	□ 50-90%	□ >90%	□ 50-90%	□ >90%
Leaf/brush dumping	□ <10%	□ 10-50%	□ <10%	□ 10-50%	□ <10%	□ 10-50%
	□ 50-90%	□ >90%	□ 50-90%	□ >90%	□ 50-90%	□ >90%

Comments:

Indicate the number and type of structures present within the buffer zone. (Structure categories: Agricultural, Commercial, Industrial, or Residential)

	Inner	Middle	Outer
# of structures			
Type of structure			

Comments:

Sketch the buffer zone: