Comparison of Wetland Functional Assessments in Texas and Louisiana

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INTRODUCTION

A functional assessment of wetlands provides an analysis of various ecological functions (e.g. wildlife habitat, flood flow alteration, water quality, sediment trapping) that each wetland provides in order to assess overall wetland quality. Functional assessments are a critical part of mitigation bank establishment, as well as the U.S. Army Corps of Engineers (USACE) permittee mitigation plans under Section 404 of the Clean Water Act. These assessments are quantified and standardized into "functional units," allowing wetlands with different characteristics to be compared. These functional units are used to determine how many credits are needed from a mitigation bank to offset the impact incurred by a permitted project.

In this study, we compare four different functional assessment models currently used by the USACE in Texas and Louisiana (Galveston, Fort Worth, Vicksburg, and New Orleans Districts) by evaluating the differences in functional scores, credits, and costs associated with each model.

METHODS

On October 20th, 2011, we conducted a functional assessment workshop as part of the annual meeting of the South Central Chapter of the Society of Wetland Scientists (SWS). The workshop was attended by 30 participants and included academics, consultants, and mitigation bank professionals. Due to the geographic location of the meeting and the composition of participants, four functional assessment models were chosen that are commonly used in that region (HGM, TXRAM, Charleston Method and Modified Charleston Method). Each of the functional assessment models examines wetland characteristics within an ecologically based context; however, each model assesses wetland characteristics at different levels of ecological complexity.

Data on wetland characteristics were supplied to the workshop participants in order to run each functional assessment model. These data included information on vegetation, hydrology, ecological complexity, and other factors unique to each functional assessment. After each of the four functional assessment models were run, we compared the results of each model.

STUDY SITE

Our study site was located in Lafayette Parish, Louisiana, southwest of the Lafayette Regional Airport, and approximately three miles from the U.S. Geologic Survey (USGS) National Wetlands Research Center (Figure 1). This wetland (ca. 10 acres) was part of a larger palustrine, forested wetland complex (ca. 20,000 acres) that was characterized by temporary or seasonal flooding and dominated by broad and needle-leaved woody vegetation of at least six meters in height. The corresponding "mitigation area" (ca. 100 acres) chosen for the analysis was located approximately 12,000 feet northeast of the case study wetland. This mitigation area was located within the forested wetland complex, but recent land use had converted this parcel to an unmaintained pasture.

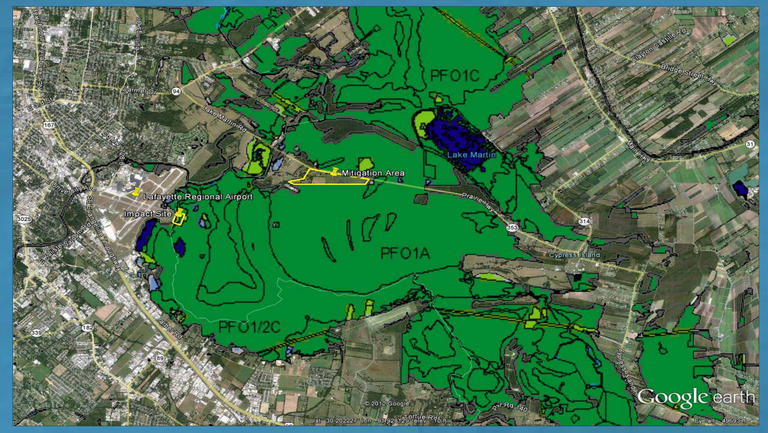

Figure 1. Location of the study site in Lafayette, Louisiana.

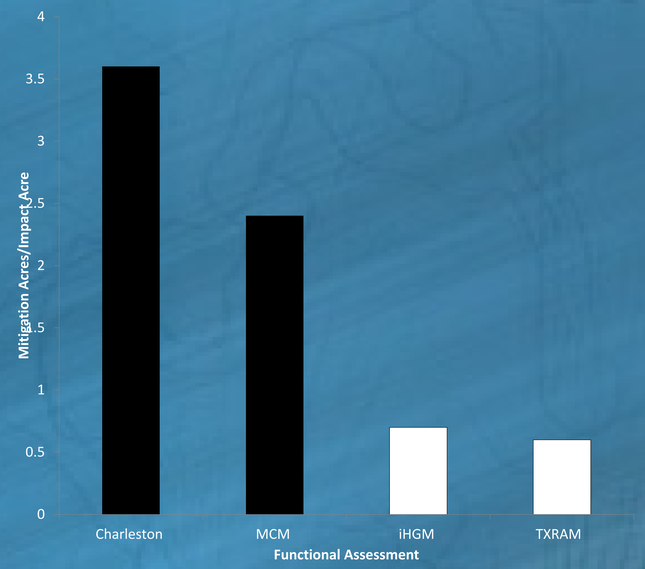

Figure 2. Number of acres that require mitigation per number of impacted acres by each type of functional assessment.

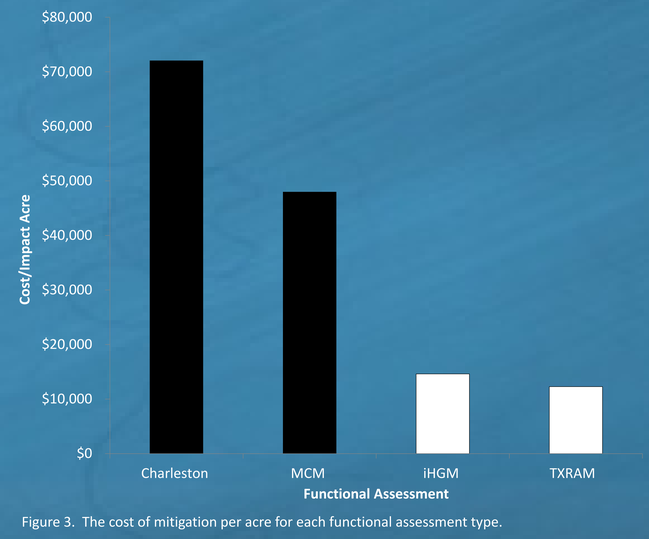

Figure 3. The cost of mitigation per acre for each functional assessment type.

RESULTS

A comparison of the models shows the Functional Capacity Units (FCU) needed, total cost, cost per impact acre, mitigation acres/impact acres, and mitigation acreage needed were all higher for the Charleston and Modified Charleston assessments than for the more ecologically complex iHGM and TXRAM assessments (Figures 2 and 3).

DISCUSSION AND CONCLUSIONS

The less ecologically complex Charleston and Modified Charleston methods cost more per acre and result in more mitigation per acre impacted. The iHGM and TXRAM assessments take into account greater ecological complexity, yet they yield lower costs and mitigation per acre impacted. These results imply that implementing more complex functional assessment models may minimize the amount of acreage required for mitigation, as well as reduce mitigation costs.

We recommend that future studies compare the ecological complexity of various functional assessments in order to better understand how they relate to mitigation. By doing so, we may identify if these results are specific to the study site and functional assessment models we compared, or if in general, more complex ecological assessments truly yield lower mitigation requirements.

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