Mississippi River Valley Division
Regional Planning and Environmental Division South

Amite River and Tributaries Study East of the Mississippi River, Louisiana

Appendix C-3 – Wetland Value Assessment Assumptions

November 2019

Amite River and Tributaries East of the Mississippi River (ARB) BBA18 Study:
WETLAND VALUE ASSESSMENT (WVA) MODEL ASSUMPTIONS AND RELATED GUIDANCE
Note: These WVAs will likely change and will be updated following a thorough WVA of the study area.

PREFACE

Several of the assumptions set forth in this document are based on mitigation implementation schedules. Many sections include specified WVA model target years (TYs) and calendar years applicable to assumptions, and a few sections outline anticipated mitigation construction (i.e. mitigation implementation) schedules. It is critical for the WVA analyst to understand that this document has not been revised to account for changes to the mitigation implementation/construction schedules. It is therefore imperative for the analyst to obtain the most recent mitigation implementation/construction schedule for a particular mitigation project from CEMVN prior to running WVA models. The analyst may then need to modify some of the WVA model assumptions and guidelines presented herein to account for differences between the present mitigation implementation/construction schedule and the schedule(s) that were assumed in generating this document.

Preliminary WVAs were conducted to compare the effects of each alternative to fish and wildlife resources. Roadside site assessments were used to document the existing vegetation at the four small dry dams (i.e. Lilley, Darling, Bluff, and Sandy Creek) within the final array of alternatives. Impacts to the forested communities were estimated based on anticipated flood depths and durations, and by using flood tolerances of the tree species present (U.S. Geological Survey data), growth rates of those species (U.S. Forest Service data), and aerial photography. The purpose of the preliminary WVAs is to help select the tentatively-selected plan (TSP). Once right-of-entry is obtained, final WVAs will be completed to determine mitigation requirements for the TSP. Assumptions in the preliminary WVAs during the comparison of mitigation costs indicate the Darlington Dry Dam footprint would impact approximately 1,330 average annual habitat units (AAHUs) of bottomland hardwood habitat (BLH)[1]. See Figure 1 below for the comparison of impacts (i.e. in acres and AAHUs lost). The impact to AAHUs will be further refined in the final WVA.

The USACE's Civil Works WVA – Bottomland Hardwoods (Version 1.2) is the WVA model used to assess environmental effects for this project.

[1] There will likely be impacts associated with the staging area and for borrow sources; however, because the locations of the staging area and the borrow sources have not been determined, their impacts will be discussed in the final EIS and/or a supplemental NEPA document.

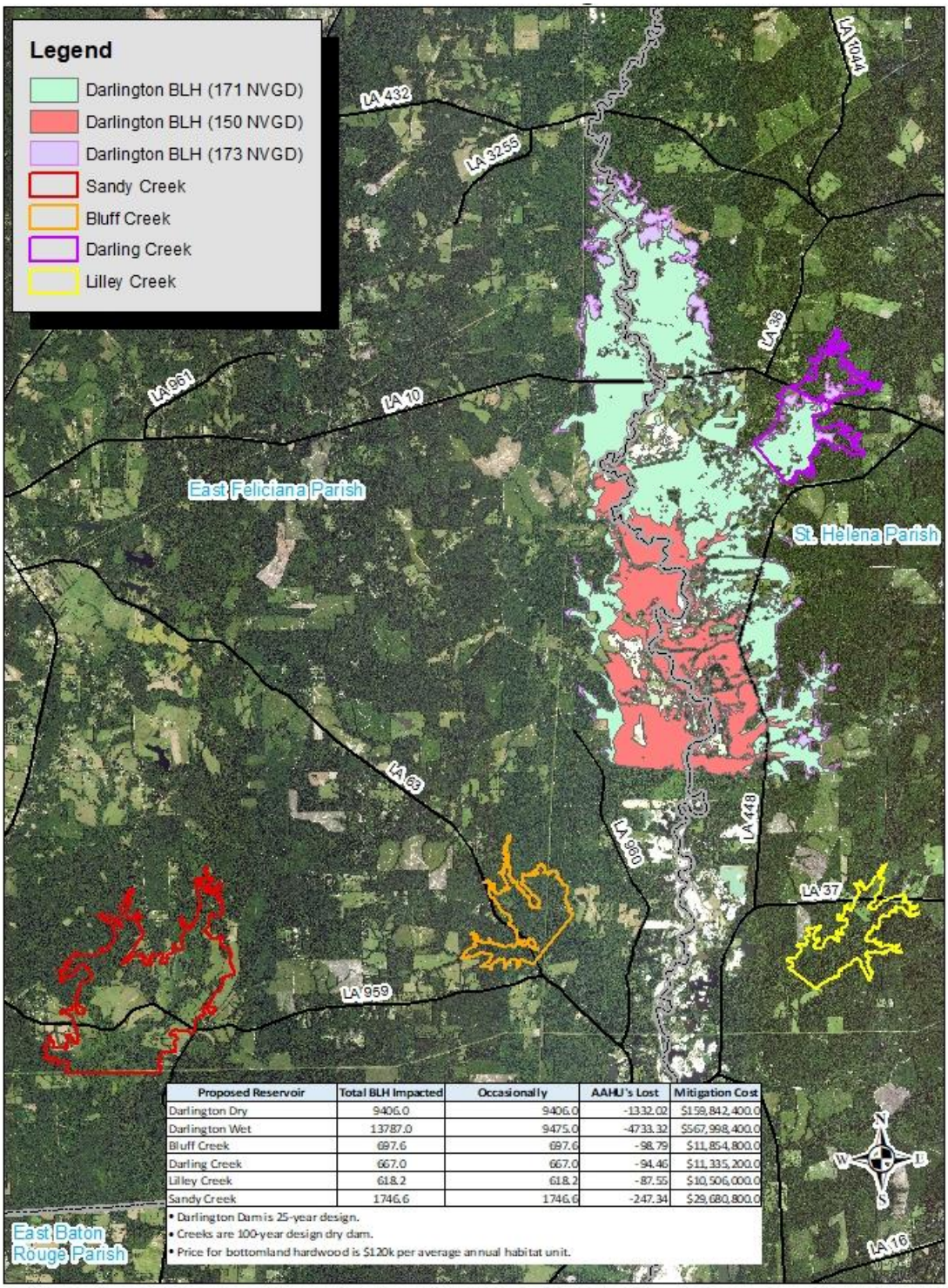

Figure 1. Amite River and Tributaries Mitigation Areas with associated elevations of flood pools in National Geodetic Vertical Datum of 1929 (NGVD).

1.1 BOTTOMLAND HARDWOOD MODEL – GENERAL ASSUMPTIONS

V1 – Tree Species Association/Composition (in canopy stratum – percentage of trees that are hard mast or other edible-seed producing trees and percentage that are soft mast, non-mast/inedible seed producing trees)

BLH-Wet restore, FWP scenario:

- Of the total trees initially planted, 60% will be hard mast-producing species and 40% will be soft mast-producing species. Assume this species composition ratio (i.e. 60% of trees are hard mast-producing and 40% are soft mast-producing) will remain static over the entire period of analysis (i.e. remains the same from time of planting throughout all subsequent model target years).
- Assume Class 5 is achieved once the planted trees are 10 years old. This class remains the same thereafter (i.e. Class 5 for all subsequent target years). Note that trees will be approximately 1 year old at the time they are initially planted. Thus, Class 5 is achieved 9 years after the time of initial planting.

General Notes:

- Do not classify Chinese tallow as a "mast or other edible-seed producing tree". Consider it a non-mast producing tree. Although it is an invasive species, one must still include this species regarding its contribution to percent cover in the canopy, midstory, and ground cover strata when it is present on a site (applicable to FWP scenario at TY0 and applicable to FWOP scenario for all model target years).

V2 – Stand Maturity (average age or density breast height (dbh) of dominant and codominant canopy trees)

BLH-Wet and BLH-Dry restore, FWP scenario -----

- Guidance as to how factors like subsidence and sea level rise might affect this variable (especially if the mitigation site becomes flooded for long durations, since the growth of trees may be adversely affected and certain tree species could die) -----

If the mitigation feature (polygon) is designed such that flooding at the end of the project life will not impact tree survival, i.e. flooding is <12% of the growing season (33 days) and is no more than 20% to 30% of the non-growing season, then trees should not be adversely affected. However, if the site design does not achieve this goal, then adjust the tree growth spreadsheet such that typical growth is reduced by at least 10% once flooding exceeds 20-30% of the non-growing season or is 12% or more of the growing season (Conner et al.; Francis 1983).

General Notes:

- Include the DBH of Chinese tallow when working with this variable (for FWOP scenario in all model target years and for FWP scenario at TY0). The same guidance would apply to other invasive species in the canopy stratum.
- For planted trees – You can use the age of the trees in lieu of their DBH when running the model (applies to all target years from time of planting throughout model run). Assume trees planted will be approximately 1 year old when they are first installed.

V3 – Understory/Midstory (percent cover)

BLH-Wet and BLH-Dry restore, FWP scenario --
Assumptions applicable to restoration features built in existing open water areas and for any restoration features that require deposition of fill to achieve target grades:

TY	Year	Assumption

0	2019	Understory = 0% // Midstory = 0%
		Refer to Note 1

1	2020	Understory = 0% // Midstory = 0%
2	2021	Understory = 100% // Midstory = 0%
20	2039	Understory = 25% // Midstory = 60%
50	2069	Understory = 35% // Midstory = 30% Refer to Note 2

Notes:
1. This assumption is applicable to restoration features built in existing open water areas. For restoration polygons built in other areas that are not open water or are only partially open water, values for cover in the understory and midstory strata must be based on site-specific conditions existing prior to the start of construction.
2. The specified values are based on the assumption that normal flooding conditions are present (i.e. desirable depth and duration of inundation). These values will need to be adjusted if sea-level rise is anticipated to increase flooding of the particular mitigation polygon to a degree whereby growth and/or survival of plant species in the understory and/or midstory strata are adversely impacted.
3. Keep in mind that canopy and midstory species will not be planted in restoration features built in open water areas until 1 year after the initial fill (borrow) has been placed in the mitigation feature. This allows 1 year of fill settlement prior to plantings.

BLH-Wet restore and BLH-Dry restore, FWP scenario --
Assumptions applicable to restoration features that do not require deposition of fill to achieve target grades:

TY	Year	Assumption
0	2019	Refer to Note 1
1	2020	Understory = 100% // Midstory = 0%
20	2039	Understory = 25% // Midstory = 60%
50	2069	Understory = 35% // Midstory = 30% Refer to Note 2

Notes:
1. Values for cover in the understory and midstory strata must be based on site-specific conditions existing prior to the start of construction.
2. The specified values are based on the assumption that normal flooding conditions are present (i.e. desirable depth and duration of inundation). These values will need to be adjusted if sea-level rise is anticipated to increase flooding of the particular mitigation polygon to a degree whereby growth and/or survival of plant species in the understory and/or midstory strata are adversely impacted.

General Notes:

- Cover accounted for by Chinese tallow and other invasive and nuisance plant species must be included in the percent cover data (applicable to FWOP scenario in all model target years and to FWP scenario at TY0).
- Changes in hydrology could result from factors such as sea-level rise and subsidence. An increase in the duration of flooding will typically decrease the understory cover and, to a lesser degree, decrease the midstory cover.

V4 – Hydrology (flooding duration and water flow/exchange)

BLH-Wet restore, FWP scenario -----
Assumptions applicable to restoration features built in existing open water areas and for restoration features that require deposition of fill to achieve target grades.

TY	Year	Assumption
0	2019	Baseline conditions (score based on existing hydrology)
1	2020	Duration = dewatered // Exchange = none
2	2021	Duration = temporary Refer to Note 1
20	2039	Duration = temporary Refer to Note 1
50	2069	Duration = temporary Refer to Notes 1 and 2

Notes:
1. Scoring of water flow/exchange component of hydrology must be based on site-specific conditions anticipated.
2. The specified value for flooding duration is based on the assumption that normal flooding conditions are present (i.e. desirable depth and duration of inundation). This value will need to be adjusted if sea-level rise is anticipated to significantly increase the duration of flooding in the particular mitigation polygon. In many cases, it is probable that the duration may shift from temporary to seasonal.

BLH-Wet restore, FWP scenario -----
Assumptions applicable to restoration features that do not require deposition of fill to achieve target grades and to BLH-Wet enhancement features where hydrologic enhancement is a component of the mitigation design.

TY	Year	Assumption
0	2019	Baseline conditions (score based on existing hydrology)
1	2020	Duration = temporary Refer to Note 1
2	2021	Duration = temporary Refer to Note 1
20	2039	Duration = temporary Refer to Note 1
50	2069	Duration = temporary Refer to Notes 1 and 2

Notes:
1. Scoring of water flow/exchange component of hydrology must be based on site-specific conditions anticipated.
2. The specified value for flooding duration is based on the assumption that normal flooding conditions are present (i.e. desirable depth and duration of inundation). This value will need to be adjusted if sea-level rise is anticipated to significantly increase the duration of flooding in the particular mitigation polygon. In many cases, it is probable that the duration may shift from temporary to seasonal.

3. For BLH-Wet enhancement features that do not include measures to enhance existing hydrology as part of the mitigation design, the scoring of variable V4 must be based on site-specific conditions hence no general assumptions are applicable.

BLH-Dry restore or enhance, FWP scenario -----

- Score flooding duration as "dewatered" during all target years used in the model.

V5 – Size of Contiguous Forested Area

BLH-Wet & BLH-Dry restore, FWP scenario:

- Do not consider the mitigation polygon to classify as "forested" until the planted trees are 10 years old. Remember that trees will be 1 year old when they are first installed; hence, the mitigation polygon would classify as forested 9 years following the year of initial planting. Prior to this target year, the trees initially planted in the mitigation polygon will be considered as either understory or midstory cover. For the target year when the planted trees reach 10 years old and for all model target years thereafter, the planted trees will be considered large enough for the mitigation polygon to be considered a forest. Hence at the target year planted trees reach 10 years old and all target years thereafter, the mitigation polygon can be included in the calculation of forested acreages (along with contiguous forested areas outside the mitigation polygon).

BLH-Wet and BLH-Dry restoration, FWP and FWOP scenarios:

- For areas outside the mitigation polygons, assume the conditions present at TY0 will remain unchanged throughout the life of the mitigation project. As used here, the term "mitigation polygons" refers to all proposed mitigation polygons regardless of the target habitat proposed. For example, a particular mitigation site could contain both a BLH-wet restoration polygon and a swamp restoration polygon. Under the FWP scenario, one would assume that the 2 restoration polygons would become forested over time but existing forested areas outside the limits of these polygons would remain forested throughout the period of analysis. Under the FWOP scenario, existing conditions would prevail in both the 2 restoration polygons and in the areas outside the limits of these polygons throughout the period of analysis.

General Notes:

- When scoring this variable for the FWP scenario, the area within the mitigation polygon itself as well as the adjacent "non-mitigation" areas are combined to generate the total forested acreage. However, remember the assumption that planted trees in restoration features will not be considered large enough for the feature to classify as a forest until the planted trees are 10 years old.
- When evaluating the size of contiguous forested areas, non-forested corridors <75 feet wide will not constitute a break in the forest area contiguity.

V6 – Suitability and Traversability of Surrounding Land Uses (within 0.5 mile of site perimeter)

BLH-Wet and BLH-Dry restoration, FWP scenario:

- When scoring a given BLH mitigation polygon, include the nearby or adjacent mitigation polygons in your assessment of land use types by assuming their land use type is the habitat type proposed (i.e. the target habitat type). However, one must consider the TY that the

nearby/adjacent mitigation polygon will actually shift from its existing habitat type to the target habitat type. For example, if the adjacent mitigation polygon is a marsh restoration feature then the change from the existing habitat type (open water typically) to the target marsh habitat would not occur until TY2 (2020).

BLH-Wet and BLH-Dry restoration, FWP and FWOP scenarios:

- When evaluating this variable, typically assume that land uses in lands outside the mitigation polygons will score the same under the FWP and FWOP scenarios. In other words, typically assume that the existing conditions present in TY0 will remain unchanged over the life of the mitigation project. One would typically not consider potential future land development rates when scoring this variable due to the uncertainty of long-term development trends. Exceptions to this general approach would include:
  - Situations where there is a high level of confidence that a particular area is slated for a significant change in land use (e.g. construction of I-49 through the Dufrene Ponds mitigation site).
  - Situations where it is anticipated that the "land use" (habitat type) will significantly change over time due to the effects of sea-level rise and land loss (e.g. existing adjacent marsh lands rated as highly suitable/traversable changing to open water, a much lower score, due to shoreline erosion or other land loss factors).

V7 – Disturbance (sources of disturbance vs. distance from site perimeter to disturbance source)

BLH-Wet and BLH-Dry restoration, FWP and FWOP scenarios:

For consistency purposes, assume baseline conditions affecting the scoring of this variable will not change over time. In other words, typically assume that the existing conditions present in TY0 will remain unchanged over the life of the mitigation project.

General Notes:

- When scoring this variable, all distances are measured from the perimeter of the BLH mitigation polygon itself.