Appendix I

Potential Adverse Change to Wetland Function Assessment

DRAFT

Introduction

As part of North Florida Regional Water Supply Plan (NFRWSP) development, the St. Johns River Water Management District (SJRWMD) and Suwannee River Water Management District (SRWMD) (Districts) assessed the extent to which water resources and related natural systems may be impacted by projected increases in water use through 2045. Adverse Change to wetland function is one component of the water resource assessment, along with saltwater intrusion/upwelling, minimum flows and levels (MFLs), priority waterbodies without MFLs, and water reservations. This information helps guide the delineation of water resource caution areas and the formulation of project options.

This document details the methods used to assess wetlands in the NFRWSP area associated with projected water demand at the planning horizon (2045) and the assessment results. Although significantly altered wetlands have occurred in the past due mainly to farmland conversion and urbanization, wetlands can be altered by factors other than groundwater withdrawals (e.g., modification of surface water hydrology). Therefore, this analysis focused exclusively on assessing the adverse change to existing wetlands due to projected increases in groundwater demand. The outcome of this assessment was used with other factors in determining whether traditional water supply (i.e., fresh groundwater) sources are sufficient to meet future water demands.

Background

In previous Water Supply Plans and Assessments, the probability of adverse change in wetland functions was determined using variations of the Kinser-Minno method incorporated into a GIS model (Kinser and Minno, 1995; Kinser et. al., 2003). The Kinser-Minno method provides an estimation of the magnitude (acres), degree (high vs. low), and spatial distribution of the potential future adverse change to wetlands throughout the District. The GIS model conducts a matrix analysis utilizing conditional statements dependent on soil permeability, sensitivities of plant communities to dewatering, and projected declines in the surficial aquifer (SA) to estimate the potential adverse change to individual plant communities that may occur if future water demands were met with traditional sources. The model was updated in 2003 and 2008, which included the depth to the Upper Floridan Aquifer (UFA) potentiometric surface as an additional screening parameter for the areas of unconfined UFA The additional steps of incorporating the depth to the UFA potentiometric surfaces with respect to the unconfined UFA provide further analysis depending on whether or not the area is hydraulically connected to the UFA and therefore, would or would not be influenced by changes in UFA levels. Since then, the model has received many minor updates such as the inclusion of a Digital Elevation Model (DEM).

The Kinser-Minno GIS Model was reviewed and updated in 2022. The soils data, vegetation layer, and the Digital Elevation Model (DEM) data were updated. Another screening parameter, depth to water table or SAS, was introduced for the areas where the UFA is confined. An additional tool was added to the workflow to make the thresholds

DRAFT

for depth to water table and depth to potentiometric surfaces adjustable. The updates to the model are described in detail in Attachment A.

Methodology

The 2022 Kinser-Minno tool (Attachment A) was used to simulate potential adverse change in wetlands based on increased groundwater withdrawals (drawdown) between current pumping (CP) and 2045 projected withdrawals. Due to the way in which the Kinser-Minno applies screening criteria, the tool was run using the pumps-off (PO) baseline conditions. Therefore, the tool used both PO to 2045 drawdown, and PO to CP drawdown. The difference in spatial and numerical results were subsequently used to estimate the effects of CP to 2045 drawdown. The area of potentially affected wetlands was summarized by county for the NFRWSP planning region. Furthermore, the Kinser-Minno tool predicts low, moderate, and high potential adverse change, but only moderate and high potential adverse changes were considered in the analysis.

Results of CP to 2045 Assessment

The analysis identified a total of 8,067 acres of wetlands with a moderate to high potential for adverse change based on increased groundwater withdrawals between CP and the 2045 projection (Table I1 & Figure I1). Of the total area, 1,703 acres were in the SRWMD, and 6,364 acres were in the SJRWMD. Flagler county had the highest potential for adverse wetland change with 4,263 acres identified. No potential adverse change to wetlands was predicted for Baker, Bradford, Duval, or Union counties.

Table I1. Land area (ac) by county in the NFRWSP with a moderate to high potential for adverse change to wetlands

County	Wetland Area (ac)
Alachua	726
Baker	0
Bradford	0
Clay	432
Columbia	62
Duval	0
Flagler	4,263
Gilchrist	1,226
Hamilton	157
Nassau	62
Putnam	309
St. Johns	741
Suwannee	91
Union	0
Total	**8,067**

DRAFT

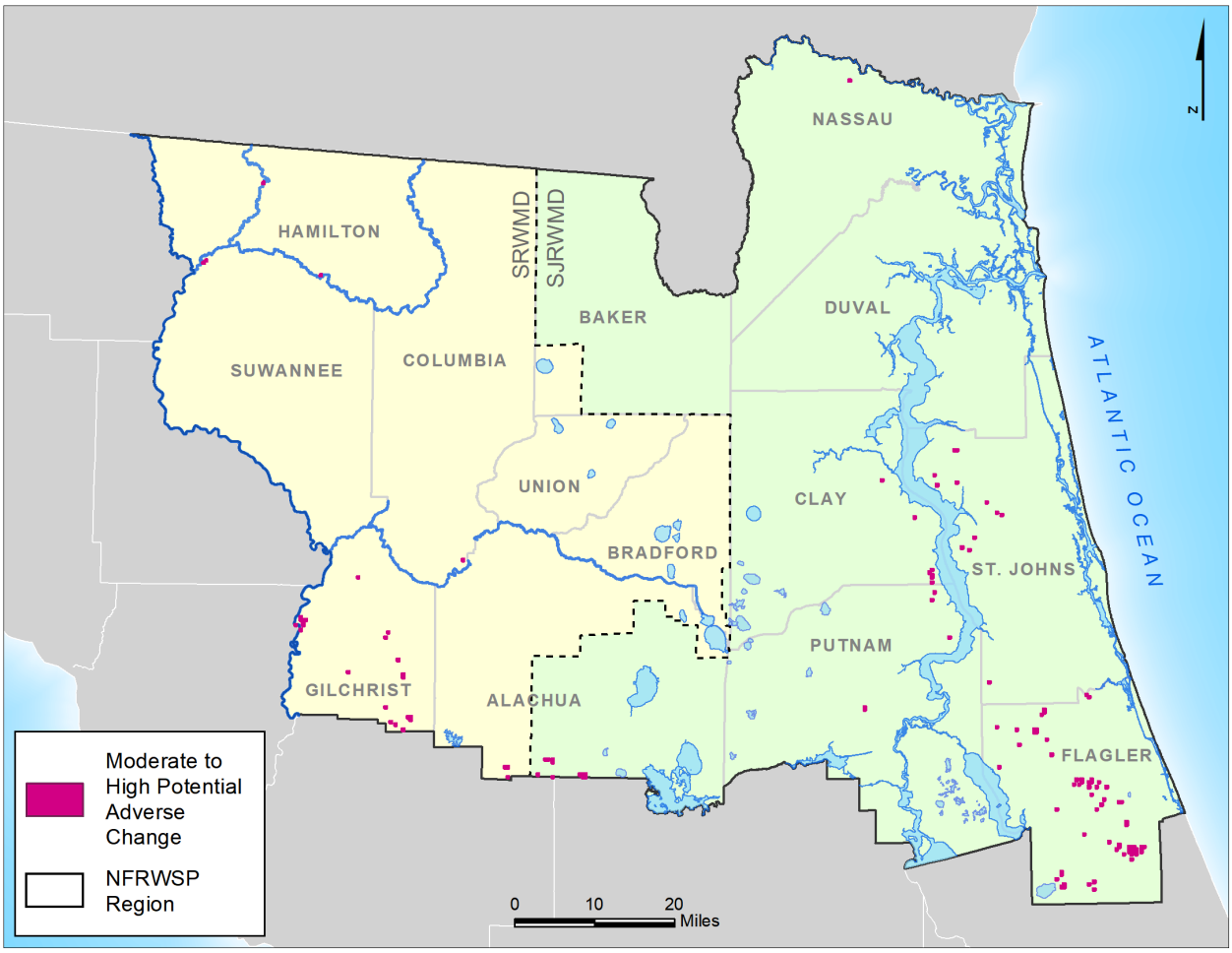

Figure I1. Locations with moderate to high potential for adverse change to wetlands

DRAFT

See Attachment A

DRAFT