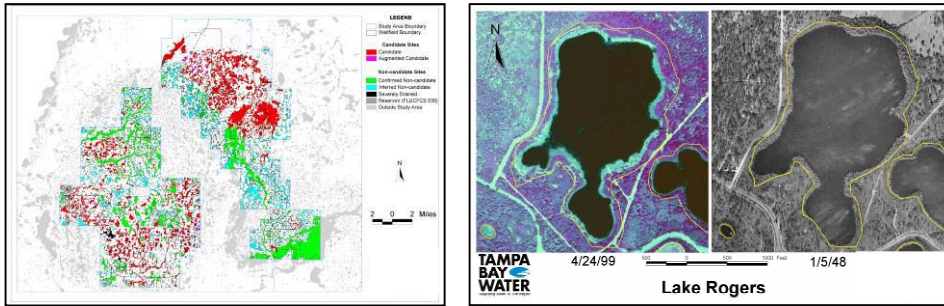


Phase 1 Mitigation Plan



Client/Owner: Tampa Bay Water

Project Location: Hillsborough, Pasco, Pinellas Counties, Florida

In compliance with Tampa Bay Water’s Consolidated Water Use Permit, GPI performed three phases of research between 1999 and 2001 to identify, map, prioritize for mitigation, and develop mitigation plans for wetlands potentially affected by historical groundwater production in the Northern Tampa Bay Region.

Candidate Phase I Mitigation Sites GIS Inventory

GPI developed a GIS database inventory and a series of Geographic Information Systems (GIS) maps delineating potential candidate environmental mitigation sites in the Northern Tampa Bay Region. Candidate sites were defined as those wetland environmental features (i.e., wetlands, lakes, and surface waters), which exhibit unacceptable adverse impacts not likely to be fully addressed by the reduction in groundwater withdrawals from the Central System Wellfields required by the Consolidated Permit. The study area boundary encompassed 362 square miles within and in the vicinity of eleven public supply wellfields. A variety of data sources in different forms and projections were utilized in developing the candidate sites GIS inventory, including: a stressed wetlands GIS database developed by the Southwest Florida Water Management District (SWFWMD), SWFWMD generated hard copy maps, a list of stressed lakes developed by Hillsborough County, Tampa Bay Water consultant reports and maps, and interviews with SWFWMD staff and Tampa Bay Water wellfield consultants. Of the 11,501 wetland polygons (72,244 acres) contained within the study area boundary, 3,408 polygons (27,969 acres) were identified as potential candidate mitigation sites based on their known stressed condition or proximity to other stressed wetlands.

Candidate Sites Evaluation Study

Potential candidate mitigation sites identified in the first phase of this study were evaluated for suitability as augmentation mitigation sites using on-screen color infrared and black-and-white aerial photo-interpretation, ecological field assessments, and hydrologic modeling. Historical (pre-wellfield production) and more recent (1999) aerial photos were scanned and georectified. On-screen comparisons between historical and recent photographs were made to assess the magnitude, spatial extent, and cause of site condition change. Sites that had not changed significantly or whose changes were attributable to causes other than groundwater withdrawals were excluded from consideration as mitigation candidates. Hydrologic modeling was used to estimate which sites were likely to recover to acceptable levels given planned reductions in production. Sites that were deemed unlikely to recover were ranked and prioritized for mitigation action using a multi-metric approach based on conditions outlined in the Consolidated Water Use Permit.

Planning Level Designs

GPI led a team of engineers and environmental scientists to rapidly develop planning level designs for the restoration of 155 target mitigation sites (3623 acres) in the vicinity of the 11 Consumptive Use Permit Wellfields. Options investigated for the mitigation of these sites included: surface water drainage modifications, surface water diversions, reclaimed water rehydration, and groundwater augmentation. A total of 103 separate projects were developed within six months. These planning level designs included: estimates of required mean and peak hydration rates to achieve target water levels; infrastructure needed such as wells, pipes, and ditch blocks; descriptions of permits required; total and per-acre costs of construction, operation and maintenance; and general proposed implementation schedules. Other products developed included: a method for the estimation of an average site hydration rate, site-specific hydrologic and ecological mitigation success criteria, and a determination of potential constraints associated with the implementation of the various types of projects in the different project areas.