

**Aerial Assessment of Aquatic and Riparian Habitat in the Brazos
River and Blanco River, Texas**

Prepared for:

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Introduction

Use of small, autonomous UAVs (unmanned aerial vehicles) in fisheries, watershed management, and restoration practices has gained increasing attention. This is, in part, to the UAV's (Aggieair™) relatively low cost, versatility, and instantaneous acquisition of multispectral digital aerial imagery (Chao et al. 2009; Jensen et al. 2009). Recent and current applications of the UAV include management of invasive plant species and mapping riparian habitat (Zaman et al. 2011; Jensen et al. 2011). The purpose of this study was to use the UAV to capture high resolution multispectral aerial imagery of two Texas rivers. Specifically, we sought to capture images of riparian and instream habitat within selected reaches of the Brazos River and the Blanco River. Our goal was to obtain imagery ≤ 25 cm pixel resolution and produce geo-referenced mosaics of the UAV imagery. Imagery collected by the UAV will be used by Texas Parks and Wildlife to identify available fish habitat at selected Brazos River sites and to locate areas of isolated pools within the Blanco River to facilitate removal of non native smallmouth bass.

Methods

Locations of selected reaches for the Brazos River and Blanco River were identified by Texas Parks and Wildlife personnel. Study sites included five reaches on the Brazos River ranging from 5.5 to 9.5 river kilometers and two on the Blanco River encompassing 16 and 24 river kilometers (Fig. 1 and Fig. 2).

On the Brazos River, flight altitude for the UAV was set at 500 m (i.e., 14 cm pixel resolution) above ground level (AGL) except for one site set at 600 m (i.e., 16 cm pixel resolution) AGL. All Blanco River reaches were set at 600 m AGL (i.e., Aerial coverage polygons and flight lines associated with the UAV flight altitude were created in Google Earth Pro software to ensure the selected areas would be captured by the onboard cameras (Fig. 3).

Brazos River UAV Sections

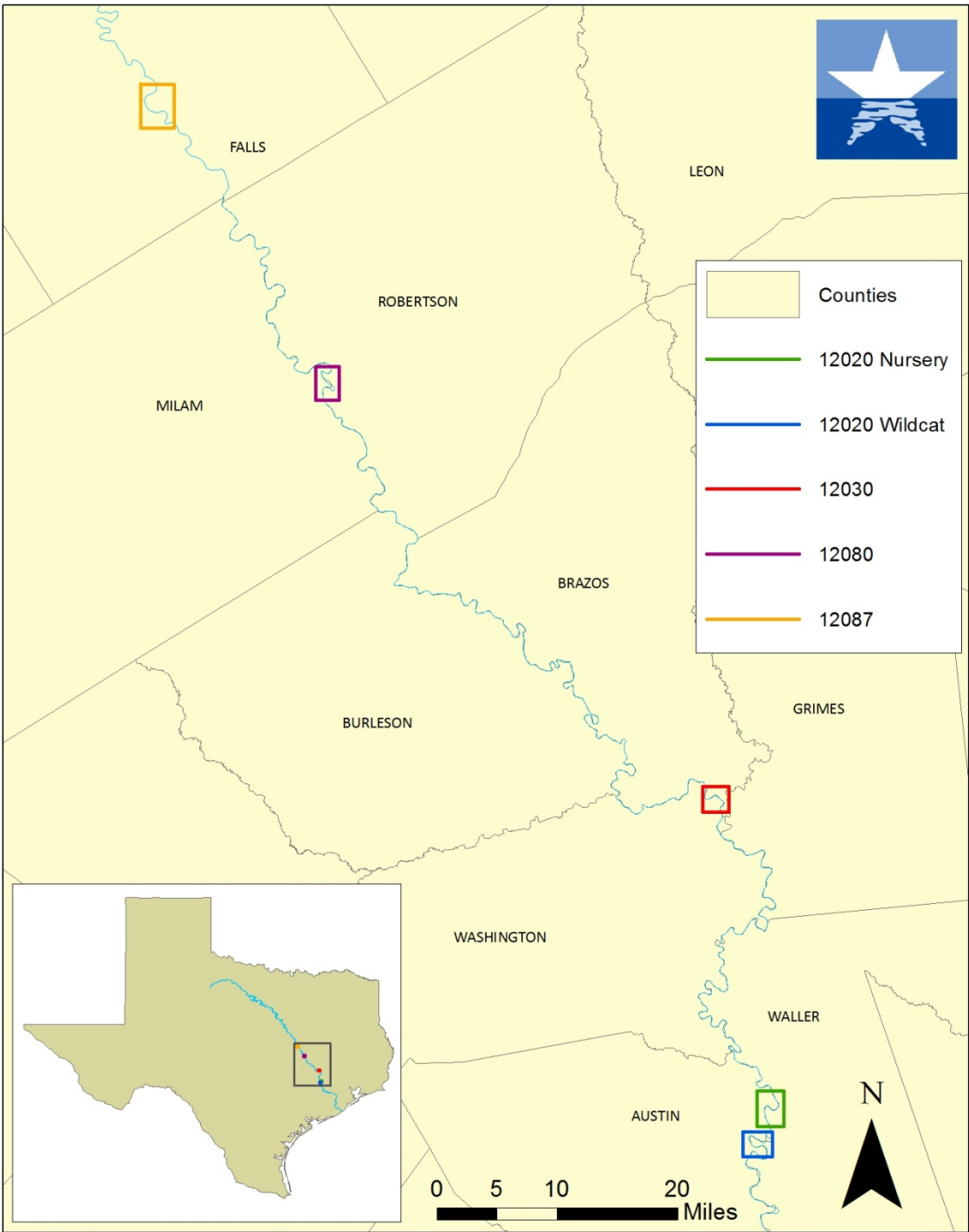


Figure 1. Selected reaches on the Brazos River, Texas.