

## EXECUTIVE SUMMARY

The Aucilla and Wacissa Rivers, including priority springs, were evaluated to determine flow regimes that would be protective of fish and wildlife habitats and recreational activities. Both rivers are classified by the FDEP as Outstanding Florida Water (OFW), and “special waters” within the OFW designation.

The Aucilla River originates from artesian springs in central Georgia and flows south approximately 89 miles to the Gulf of Mexico. Along its path it traverses marshes and lakes in northern Florida, karst limestone east of Tallahassee, and sinks and resurgences below the Cody Scarp before finally rising at Nutall Rise and flowing into the Gulf of Mexico. The river picks up tannins from decaying vegetation and acquires a black tint as it flows south. The Wacissa River is a major tributary to the Aucilla river and provides a substantial portion of the total Aucilla flow, particularly at low flows. Twelve major springs feed the Wacissa River as it flows through swampy lowlands in the Aucilla Wildlife Management Area. The Wacissa River diffuses into numerous braids for several miles before flowing into the Aucilla River.

An essential element in establishing MFLs is identifying or developing a baseline flow record that reflects historical conditions over representative long-term hydrometeorological cycles. Anthropogenic impacts should not be too large; however, it is not assumed that they are not present, but that they have minimally altered hydrology. The USGS gaging station, Aucilla River near Lamont, is most useful for characterizing regional trends because it has a long period of record (POR) that extends from October 1951 to present and is centrally located within the study area. It is the index gage for the Aucilla River MFLs. Based on the analysis of a relationship between rainfall and flow at Lamont, there is no evidence of persistent anthropogenic impacts on the streamflow at Lamont gage during the historic period of water years (WYs) 1951-2014. Hence, baseline condition, which is an estimate of unimpaired flow conditions, is defined as the POR at Lamont (WYs 1951-2014).

Flow data reported for the USGS gaging station Wacissa River near Wacissa gage are used as a surrogate for the combined flow from the springs upstream of the Wacissa gage. The station is the index gage for the Wacissa River MFLs, although its period of record is relatively short (2001 to present) and not sufficient to gage anthropogenic impacts. A spring-flow rating was developed and uses groundwater level as the explanatory variable.

In developing MFLs, current State Water Policy (Rule 62-40.473, Florida Administrative Code [F.A.C.]) provides that consideration be given to natural seasonal fluctuations in water flows or levels, nonconsumptive uses, and environmental water resource values (WRVs). Three WRVs are relevant to the two rivers and springs and have sufficient available information to develop relationships between the WRVs and system hydrology. These include (1) Recreation In and On the Water, (2) Fish and Wildlife Habitats and the Passage of Fish, and (3) Estuarine Resources.

Recreation was evaluated in terms of paddling on both rivers, and motorized boating on the Wacissa. Salinity regimes in the estuary were evaluated using a calibrated hydrodynamic model. Instream freshwater habitat was evaluated using habitat simulation models calibrated for one segment of the Aucilla River and two segments of the Wacissa River. Riparian bank and floodplain habitats were evaluated using a combination of HEC-RAS flow

profile modeling and ArcGIS mapping of riparian vegetation communities.

Three MFLs are recommended for the Aucilla River for successively higher flow regimes referenced to the index gage at Lamont.

- A 6.5% flow reduction during low to moderate flows would remain protective of the oligohaline salinity regime of the Aucilla River estuary. The 0-2 ppt and 0-5 ppt (oligohaline regimes) are most sensitive to reductions in freshwater flow of the metrics evaluated for the Aucilla River. This estuarine flow reduction limitation applies over about 72% of the baseline flow duration curve (0 to 355 cfs). The flow reductions would range from zero to 23 cfs when flow at the Lamont gage is less than or equal to 355 cfs.
- A 13% flow reduction would remain protective of bank habitat for increasingly higher flows of up to 558 cfs, which is associated with the average top-of-bank stage within the middle reach of the Aucilla River. Between 46 and 73 cfs would be available during this flow range that occurred about 8% of the time during the baseline period.
- A flow reduction of up to 17% would remain protective of floodplain habitat, various portions of which were inundated by overbank flow about 20% of the time during baseline conditions. Beginning with 95 cfs of available water at a top-of-bank flow of 558 cfs in the middle Aucilla River, increasing amounts of water could be available as limited to 17% of flow.

The three Aucilla River MFLs referenced to the Lamont gage can be translated to the Scanlon and Aucilla ADVN gages.

Two MFLs are recommended for the Wacissa River for successively higher flow regimes referenced to the index gage near Wacissa.

- A 5.1% reduction in flow during moderate to low flows less than 376 cfs would be protective of recreation activities associated with motor boating.
- A 7.3% flow reduction of Wacissa River flows greater than 376 would remain protective of instream habitat, the most limiting of which is the useable area for largemouth bass fry.

Collectively, the recommended Wacissa River MFLs also would be protective of the estuarine portion of the Aucilla River.