

A Low-cost Approach for Capturing and Processing Side Scan Sonar Imagery to Map Habitat in Navigable Rivers and Streams

Thomas L. Litts, *Georgia Department of Natural Resources, Fisheries Management Section, 2065 U.S. Hwy 278 SE, Social Circle, GA 30025*

Adam J. Kaeser, *Georgia Department of Natural Resources, Fisheries Management Section, 2024 Newton Road, Albany, GA 31701*

Abstract: A need exists within the natural resource community for an inexpensive and rapid technique for mapping and quantifying the habitat of navigable river systems. Unlike more expensive side scan sonar devices, the Humminbird Side Imaging system (US\$2,000) can be interfaced with global positioning systems (GPS) to capture spatially referenced imagery in rivers and streams that include shallow, rocky areas. Since first presenting this technique in 2007, we have refined our approach for capturing sonar imagery in the field and have developed the tools required to produce sonar image maps (SIMs) exclusively within the ArcGIS 9.x geographic information system (GIS) software. The resulting SIMs are high resolution (~10 cm) GIS layers revealing continuous, bank-to-bank, river bottom habitat that can be interpreted and analyzed to map features such as substrate types, large woody debris, and relative depth. To demonstrate the utility of sonar-based maps and to explore the effective boundaries of the technique we conducted a series of mapping studies on small (width 30–50 m) to medium sized (90–130 m) river systems in Northwest and Southwest Georgia. Overall, the technique produces accurate, spatially explicit habitat maps of underwater landscapes. The applications of such detailed maps are widespread and numerous and accessible to researchers and managers alike.

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