

SNOOK USE OF THERMAL REFUGIA ALONG THE NATURE COAST: IMPLICATIONS FOR MINIMUM FLOWS AND LEVELS

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Globally, rising temperatures have resulted in numerous examples of poleward expansions of species distribution patterns with accompanying changes in community structure and ecosystem processes. In the northern Gulf of Mexico, higher mean temperatures and less frequent winter freezes have led to the expansion of tropically-associated marine consumers, such as Common Snook *Centropomus undecimalis* into the Cedar Keys area of Florida, USA (29 deg N). The snook is an economically and recreationally important sportfish found from southern Brazil to south Florida. The area surrounding Cedar Key, FL and the Lower Suwannee River is north of the snook's historically documented range, likely due to lethal water temperatures during winter. The locations of winter thermal refuges (e.g., freshwater springs) are of critical importance for annual persistence of this population and require identification. Moreover, snook use of springs during cold periods have implications for land-use policy and minimum-flow regulations for rivers and thus snook may be used as an ecological indicator for management purposes. Here, we discuss ongoing efforts to highlight fish use thermal refugia throughout the Nature Coast region. Preliminary results from acoustic tagging indicate strong seasonal use of springs, rivers, and other inshore wetlands, especially during colder periods. Future work will focus on the behavioral ecology of snook in these areas during critical thermal periods, as well as quantification of thermal refugia during variable discharge and temperature conditions. This work has strong implications for setting minimum flows and levels for the management of groundwater and aquifers throughout snook's recently expanded area.

PRESENTER BIO: Dr. Martin is an estuarine ecologist at the UF/IFAS Nature Coast Biological Station in Cedar Key, Florida. He has over two decades of experience in research of Gulf of Mexico ecosystems with over 48 publications, most notably focusing on habitat-animal interactions in nearshore Gulf ecosystems.