

A method for generating instantaneous estimates of PIT tag array efficiency

Wathen, G., S. Anglea, and C. Beasley

The efficiency of instream PIT tag arrays is commonly estimated using simple mark-recapture estimates generated by observations of tags at an array of interest and at an additional interrogation facility (e.g., another nearby array). Problematically, efficiency estimates generated by these simple mark-recapture methods require multiple observation events, and are thus best suited for situations where efficiency estimates are applied to “periods” such as weeks or migration seasons. We explored virtual test tag, current draw, signal level, and antenna noise to evaluate their predictive capacity with regard to realized read range (actual distance of 95% detection probability above a coil). Coupled with information on water depth and fish behavior, we evaluated an approach to generate an “instantaneous” estimate of efficiency. Instantaneous estimates of array efficiency may be useful when the observation of a single PIT tag requires expansion for tags that are expected to pass a site undetected.