

Migration patterns of the Pamunkey River spawning stock.

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Based upon mark-recapture techniques and supported by genetic analysis, the number of adults tagged in the Pamunkey River now represents approximately 20 percent of the adult spawning population (Kahn et al. 2014). With such a sizable portion of the adult population tagged and genetically confirmed as native Pamunkey River fish, it has become possible to begin to confidently examine numerous factors inherent to the population, even given the relatively short duration of this research effort. We examined the spatial and temporal aspects of adults tagged in 2013 and 2014 on their spawning runs in 2014 and 2015 to detect patterns. Run characteristics in the year of tagging were not examined because tagging can alter short-term behavior (Winter 1983, Sutton and Benson 2003, Hager 2011). Nine of the 12 males tagged in 2013 returned in 2014 (75%). Eleven of the 12 adult males tagged in 2013 returned in 2015 (92%). Of the 34 adults tagged in 2014, 18 returned in 2015 (53%), including one female. Based upon 2014 and 2015 migration data, the Pamunkey River's spawning stock's immigration and emigration patterns are highly varied spatially and suggests very different behavioral approaches. Upon immigration 24 out of 36 (67%) adults used the Baltimore Channel, seven (19%) used the Baltimore and Thimble Shoals Channel and three (8%) used the Thimble Shoals Channel only. Upon emigration, use of the Baltimore Channel was greatly reduced (39%). Fish did not select the more western Thimble Shoals channel as an alternative, in fact, none have been recorded using this channel during emigration. The largest variation between reception data upon immigration vs emigration was the dramatic increase in the number of fish that are not detected when leaving Bay. In the spring only 6% of returning fish used an undetected pathway, upon emigration 44% were not detected. Detection volume at shallow water Eastern Shore sites was nearly equal during immigration and emigration, which may suggest shallow water emigration behavior. Regardless of the method of detection avoidance, tracking data suggests that seasonal alterations in migration patterns and behavior are occurring and may be significant. A better understanding of the spatial and temporal characteristics of the Pamunkey River's spawning stock's migrations is essential to protecting it but understanding the implications of such seasonal alterations, if they occur coastally, is critical to tailoring best management practices for the whole species' conservation.