

Evening Movement Patterns in Permit Pre-Spawn Aggregations as Observed by Active Acoustic Tracking

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Reef-associated fish species often form transient, site-specific pre-spawning aggregations, synchronized with lunar cycles and environmental cues. Among these, the Permit is ecologically significant and economically valuable to recreational fisheries across the western Atlantic, including South Florida. Permit exhibit complex life history strategies involving habitat shifts, utilizing mangrove flats and seagrass beds during juvenile stages and adults are known to migrate between these flats and offshore reefs. Permit are known to aggregate in the Lower Keys near the Western Dry Rocks (WDR) reefs in 20m of water from March to June each year, with peaks in abundance coinciding with full moons each month. Ongoing research has revealed that schools are persistent on the reef until 1500-1600 EST each day, at which time they leave the immediate area and can no longer be observed. This study aims to improve our understanding of the movement patterns of permit spawning aggregations at the WDR aggregation site. Permit aggregations were tracked using a VR100 directional hydrophone and common acoustic telemetry tags with long delays (1-3min) that had been previously implanted in more than 140 permit at WDR since 2020. We tracked permit schools from 1200-2000 EST on 5/13 – 5/15 to understand where they go in the evening hours. Data suggests that permit move off the reef shelf into deeper habitats near 25-30m, but additional analysis is being performed to understand the specifics of when and where this permit aggregation goes during these later hours. An acoustic doppler current profiler and split beam echosounder were deployed simultaneously with the hydrophone, which will allow us to infer whether environmental factors influence their movement to deeper depths. The findings will contribute to the broader understanding of pre-spawning behaviors of permit and could promote sustainable recreational fisheries practices when expanded to include interactions and behaviors in the presence of anglers and predators.