Movement Patterns of Spotted Eagle Rays (*Aetobatus narinari*) Along Southwest Florida and in the Gulf of Mexico

Los Patrones de Movimiento de los Rayos de Águila Manchada (*Aetobatus narinari*) a lo Largo del Suroeste de la Florida y en el Golfo de México

Motifs de Mouvements des Rayons D'aigle Tachetés (*Aetobatus narinari*) le Long du Sud-ouest de la Floride et dans le Golfe du Mexique

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EXTENDED ABSTRACT

The whitespotted spotted eagle ray, *Aetobatus narinari*, is a large, wide-ranging benthopelagic ray found in coastal and estuarine ecosystems in the Atlantic, including the Gulf of Mexico and Caribbean Sea (Last et al. 2016). Although this species is protected in Florida waters, it is targeted in fisheries in several countries including Mexico, Cuba, and Venezuela, causing concern for its conservation status (currently listed as "Near Threatened" on the IUCN Red List) due to decreasing population trends (Kyne et al. 2006, Cuevas-Zimbrón et al. 2011, Tagliofico et al. 2012). Understanding movement patterns is crucial to determining the mechanisms of population structure in spotted eagle rays. Preliminary satellite and conventional tagging data combined with molecular data indicate these rays are capable of extensive migrations (Sellas et al. 2015). As part of an ongoing tagging study using PIT tags along the west coast of Florida near Sarasota, some individuals have been recaptured over weeks to years suggesting the species exhibits a degree of fidelity to the region (Bassos-Hull et al. 2014).

An acoustic tagging study was initiated in spring of 2016 to examine fine-scale movements in and out of coastal estuaries along Florida's west coast, while also monitoring longer distance movements via collaborative acoustic telemetry networks (i.e., iTAG and FACT). During spring 2016 (n = 15) and spring 2017 (n = 9), 24 spotted eagle rays were internally fitted with Vemco V16 acoustic transmitters and monitored with acoustic gates covering inlet passes in Sarasota Bay. Most detections of study animals (n = 92899 total detections all rays) ranged from weeks to months in three passes in the Sarasota study area and several tagged individuals were detected in collaborative network arrays up to 100 km away generally moving south in cooler months. Four rays were detected further than 100 km from the Sarasota study area. One ray, SER527 (112.4 cm disc width male), initially tagged near Sarasota in April 2016 was detected in the Florida Keys during November 2016. Three rays, two males and one female all larger than 150 cm disc width, were detected in Apalachicola Bay in the northern Gulf of Mexico during July and August of 2017. All rays tagged in spring 2016 left the Sarasota study area when a harmful algal bloom (i.e., *Karenia brevis*) appeared in September 2016 and lasted over five months. Eight of the 15 rays tagged in spring 2016 returned to the Sarasota study area in spring 2017. These initial findings support a more northern movement in warmer months and southern movement in cooler months, though longer term data and continued reporting of detections from collaborative network members is needed to further investigate. Ultimately understanding these movement patterns in relation to environmental factors is important for enhancing management of this species in the U.S. and neighbouring countries.

KEYWORDS: Whitespotted eagle ray, *Aetobatus narinari,* acoustic tagging, movement

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