

SIZE AT FIRST MATURITY OF THE BLUE SPOTTED MASKRAY, *Neotrygon kuhlii* IN INDONESIAN WATERS

Fahmi¹⁾, Mohammad Adrim¹⁾, and Dharmadi²⁾

¹⁾ Research Centre for Oceanography-Indonesian Institute of Sciences, Ancol-Jakarta

²⁾ Research Centre for Capture Fisheries, Ancol-Jakarta

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ABSTRACT

The blue spotted maskray, *Neotrygon kuhlii* is the most common rays occurred in Indonesian waters. This species is often caught as bycatch in trawl fisheries targeting demersal fishes and shrimps. The unselected and intensive catches of this species can influence to its sustainable in the future. A study on this species was conducted at several areas in Indonesia from 2003 to 2006. A total of 1,122 individuals, consisting of 523 females and 599 males were measured from some areas in western Indonesia including the Java Sea, the Malacca Strait, South Java, East Sumatera, West Kalimantan, and South Natuna waters. Size ranges of *Neotrygon kuhlii* were varied among regions. In general, mature individuals were caught more often than neonates in all areas. The minimum size was 130 mm disc width and maximum size was 415 mm disc width. Females usually produce one pup in its reproduction cycle and the smallest recorded pregnant female was 240 mm disc width, while the largest was 317 mm disc width. Males attain maturity at size between 215 and 295 mm disc width. There were also differences in size at first maturity for *Neotrygon kuhlii* caught from each area. The rays seemed to be mature earlier at the Java Sea, West Kalimantan, East Sumatera and the Malacca Strait, as an indication of the plasticity in their life histories to cope with fishing pressure and environmental degradations in their habitats.

KEYWORDS: maturity, *Neotrygon kuhlii*, Indonesia

INTRODUCTION

The blue maskray whipray, *Neotrygon kuhlii*, is one of the most common rays occurred in Indonesian waters. This species, which is formerly known as *Dasyatis kuhlii* (see Last & White, 2008), is a small-size ray and known distributed throughout the Indo-West Pacific from India to Melanesia, including southern Japan and Australia (Last & Compagno, 1999; White *et al.*, 2006b). As demersal fishes, *Neotrygon kuhlii* can be found on insular and continental shelves to a depth of 90 m. This species is commonly caught as by catch by various fishing gears such as bottom trawls, bottom lampara nets, danish seine nets and trammel nets. This species, together with *Dasyatis zugei*, *Himantura gerrardi*, and *Himantura walga*, contributed about 75% of the total batoids caught by fisheries in eastern Indonesia during a study from 2001 and 2006 (White & Dharmadi, 2007). While in a study in western Indonesia from 2003 to 2005, *Neotrygon kuhlii* also contributed about 55% of the total abundance of recorded chondrichthyans during the study (Adrim & Fahmi, 2007).

Elasmobranch fisheries in Indonesia has become international concern due to its status as the highest total catch of cartilaginous fishes in the world (Bonfil, 1994; Stevens *et al.*, 2000). Some authors suggested that elasmobranchs are fully exploited in Indonesian waters with indications of depletion in some areas,

especially in the Java Sea and adjacent waters (Bonfil, 2002; White *et al.*, 2006b). Some common species become the targets of fishing due to the high value of their fins or skins (i.e. rhynchobatids and some dasyatids). However, management and conservation actions are difficult to implement for such species when basic data on biology and diversity of elasmobranch are either very few or not available in the region. Therefore, some high valued species are already threatened before any management responses could be put into place (Camhi *et al.*, 1998).

Studies on elasmobranch biology and life histories conducted in the Pacific region over the last few decades have included age and growth, reproduction, diet analysis to provide knowledge for sustainable fishing and management (Seki *et al.*, 1998; Oshitani *et al.*, 2003; Joung *et al.*, 2004). Study on reproductive cycle, gestation period, size at maturity, and number of pups are basic knowledge for understanding species life history (Simpfendorfer, 1992; Liu *et al.*, 1999). Knowing size at first maturity is essential that allows us to examine mature and spawning stocks for managing the species exploitation (Jennings *et al.*, 1998). Furthermore, Frisk *et al.* (2001) suggested that further knowledge on age, fecundity, mortality, and growth is crucial to realize conservation for elasmobranchs. This study is a complement of previous studies on biology of *Neotrygon kuhlii* in Indonesia (White & Dharmadi, 2007) and provides