

22. Connected they are: Genetic diversity and population structure of *Raja clavata* in the North-East Atlantic.

Timo Michael Staeudle^{1*}, Jurgen Batsleer², Jim Ellis³, Eleanore Greenway¹, Pascal Lorence⁴, Hendrik-Jan Megens⁵, Klaas Sys⁶, Verena Trenkel⁴, Jan Jaap Poos¹

¹ AFI, Wageningen University & Research, The Netherlands

² WMR, Wageningen University & Research, The Netherlands

³ CEFAS, United Kingdom

⁴ Ifremer, France

⁵ ABG, Wageningen University & Research, The Netherlands

⁶ ILVO, Belgium

* Corresponding author. E-mail: timo.staeudle@wur.nl

Raja clavata (Thornback Ray) is a near threatened skate species occurring in the North-East Atlantic and Mediterranean. It is the dominant skate species caught in commercial fisheries in northern European seas and considered as a bottleneck species by some fisheries. Historically, population declines have been observed, although increasing landings and biomass estimation indicate potentially recovering populations over recent decades. This study explores the genetic diversity and population structure of *R. clavata* Atlantic to gain deeper insight into the connectivity of its populations across boundaries of stock assessment and management units in the North-East Atlantic. After quality control, 5048 individuals samples across the North-East Atlantic with 4797 single nucleotide polymorphisms used as genetic markers remain for analyses. Pairwise F_{st} , Discriminant Analysis of principal components and Admixture models were used to explore population structures and genetic diversity. Large and small scale spatial genetic population structure is revealed for *R. clavata* across ICES ecoregions, and between ICES Subdivisions and statistical rectangles. Large spatial population structure is evident across the ecoregions Greater North Sea, Celtic Sea, and Bay of Biscay and Iberian coast, while small spatial scale population structure can be found between offshore and nearshore populations in Bay of Biscay. This research surpasses spatial boundaries often limited by individual research efforts through collaborative international sampling and research efforts to provide stock classification and assessments with novel insights about genetic populations structure and connectivity of *R. clavata* across a large spatial scale to inform fisheries management and conservation practices.