HABITAT SUITABILITY INDEX FOR SEA CUCUMBER SPECIES *Holothuria scabra* AND *Holothuria atra*: A CASE STUDY IN NORTHWEST COAST OF SRI LANKA

A.W.M.L.M. Bandara[1], S.S. Gunasekara[2], R.H.G.R. Wathsala[1]

[1]Department of Animal and Food Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura, Sri Lanka.
[2]National Aquatic Resources Research and Development Agency, Crow Island, Sri Lanka.

Sea cucumber fisheries are ineffectively managed in Sri Lanka, leading to declining stocks and potentially eroding the resilience of fisheries. Preparing the habitat suitability index (HSI) map for sea cucumbers in Sri Lanka is vital to support a wide range of management practices. Hence, this study was carried out to identify the suitable habitats for the *Holothuria* species which live in the northwest coast using remote sensing data. As input variables for the HSI, sea surface temperature, depth, bottom substrate, and turbidity were obtained using "Landsat 8 OLI" from 2018 to 2022. The HSI map was created along with four parameters calculated using parameter factor suitability functions and the weight of environmental factors. The GPS points of present and past sea cucumber fishing locations were identified through a questionnaire survey with sea cucumber fishermen. The weight factor was calculated using the Easy AHP QGIS plugin using the Delphi method. According to the Delphi method, weighing indexes for bottom substrate and depth were 0.702 and 0.161, respectively, and those are the most important conditions affecting sea cucumber habitat in the study area. The results revealed that habitats characterised by bottom substrate with coral reefs and sea grasses and depth within 10 m are ideal for sea cucumbers in the area (HSI value: 0.83-0.85). Sea cucumber fishing areas have shifted to the deep sea, more than 20 m in depth, due to the depletion of the sea cucumber population in the shallow area. Hence, the proposed HSI could be applicable for improving and enhancing the existing management practices and establishing an effective sea cucumber protection policy for the northwest coast of Sri Lanka.

Keywords: Habitat suitability map, Landsat 8, Remote sensing, Sea cucumber fisheries