

Isara Chanrachkij 2012: Environmental Impacts of Undulated Surf Clam (*Paphia* spp.) Dredge Fishing: Case Study in Paknam Pranburi Estuary and Adjacent Areas, Pranburi District and Sam Roi Yot District, Prachaub Khiri Khan Province. Master of Science (Marine Science), Major Field: Marine Science, Department of Marine Science.
Thesis Advisor: Associate Professor Shettapong Meksumpun, Ph.D. 354 pages.

Study on the Environmental Impacts of dredge fishing for Undulated Surf Clam (*Paphia* spp.) case study in Paknam Pranburi estuary and adjacent areas, Pranburi District and Sam Roi Yot District, Prachaub Khiri Khan Province, was carried out from December 2007 to February 2009. The surf clam dredge fishing operations are operated at present by using 2 iron dredge size, i.e. iron dredge size 1.8-2.4 m in width and iron dredge size 3.0-3.2 m in width. The use of these dredges impacted the Paknam Pranburi estuary and adjacent areas by disturbing the vertical profile of bottom sediment structure. Impacted areas were observed around Pranburi estuary, off coast of Khao Ka-loke, in parts of Ao Sam Roi Yot Bay and Ko Kolam Island. An unchanged, natural feature of vertical profile of bottom sediment structure was observed around the inner coastline of Ao Sam Roi Yot Bay and Ao Ban Bang Poo Bay. Prior to the 2007 fishing season, researchers found 514,801 clams/square kilometer in the subject area. After the 2007 fishing season, this number found dropped to 880 clams/square kilometer. One of the consequences of the dredge fishing operation was the loss of benthic fauna by instant death or removal from their bottom habitat. A sudden change in the ocean floor can cause a high rate to benthos which are unable to adapt to the new environment. The resulting loss of parental surf clam stock impacted new cohort replacement, and more than three years was required for natural rehabilitation. Dredge fishing operations impact the environment around Paknam Pranburi estuary and adjacent areas by reducing transparency and increasing total suspended solids ($P < 0.01$). The concentration of nutrients, i.e. Ammonium- Nitrogen, is significantly increased by dredge fishing operations ($P < 0.05$). Silicate-Silicon levels are also increased ($P < 0.10$). This enrichment of total suspended solids block oxygen exchange of marine organisms, causing death by hypoxia. The increased concentration of nutrients by re-suspended phenomena also impacted the biomass of phytoplankton around the studied habitat, enhancing the “Red Tide” phenomena around the study area, following the surf clam dredge fishing season. Dredging does, however, benefit the habitat to some degree, by reducing sulfide in the bottom sediment. Optimum dredging magnitude may enrich the nutrients of surf clam habitat.

Student's signature

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