

Red Sea Urchins

There are directed commercial fisheries in PNCIMA for three species of echinoderms: one sea cucumber and two sea urchins.¹ Red sea urchins (*Strongylocentrotus franciscanus*) tend to associate themselves with kelp biobands and are known to form feeding fronts seaward along kelp forests in the shallow subtidal zone (zero to four metres below tide).² In general, echinoderm species aggregate, resulting in significantly high population densities in areas with favourable conditions, such as available food and specific reproduction temperatures.³

The Red Sea Urchin Fishery

The commercial red sea urchin fishery is conducted by divers using short aluminum hand rakes to dislodge sea urchins from the substrate.¹ Red sea urchins are harvested for their roe (gonad).²

Total annual red sea urchin catch increased between 1990 and 2003, peaking in 1992 at 12,000 metric tonnes (see graph).^{1,4}

The red sea urchin fishery is managed separately from the green sea urchin fishery because their distribution and targeted markets are quite different.¹

Management tools for the red sea urchin fishery include a minimum size limit to allow several spawning years prior to harvest, calculation of a total allowable catch using a precautionary fixed exploitation rate of two to three percent of estimated biomass, limited entry licensing, area licensing, area quotas and an individual quota program in which the total quota is divided equally amongst licences.¹

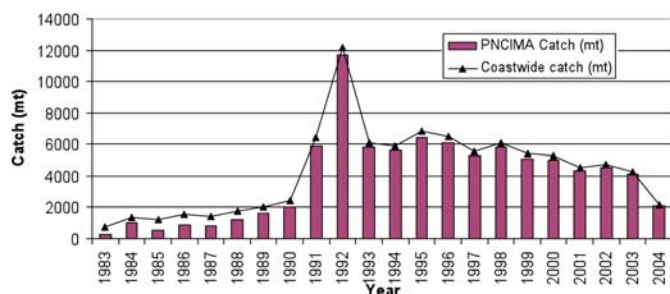
Fishery Effort

The fishery effort map, using four by four km gridded data, represents 96.3 percent of the data available for PNCIMA



Offloading red sea urchins. Photos: Juanita Rogers

Red Sea Urchin Catch in PNCIMA



after screening for confidentiality (minimum three licences reporting per grid cell). The five data classes presented on the map are based on natural groupings inherent in the data such that similar values are grouped and differences between classes are maximized (Natural Break or Jenks statistical method). Cumulative red sea urchin fishery effort is measured in dive hours.

Red sea urchins are harvested for their roe

Similar to other invertebrate fisheries, the red sea urchin dive fishery predominantly occurs along the inner coast where access, transport and shipping for product are more readily available.¹ The fishery occurs throughout the inshore waters of PNCIMA.

The proximity of fishing to the coast makes the gridded data appear to overlap land, an artifact of applying the data to the standard grid. The fishing data for red sea urchins were layered above the land only to make the data more visible.

Map data are viewable online through DFO Mapster at www-heb.pac.dfo-mpo.gc.ca/maps/maps-data_e.htm
 Material presented is drawn from the following literature reviews, which include primary references:
 1 MacConnachie, S., Hillier, J. and Butterfield, S. 2007. Marine use analysis of the Pacific North Coast Integrated Management Area. Can. Tech. Rep. Fish. Aquat. Sci. 2677: viii + 188p.
 2 Hillier, C.J., Gueret, D., Butterfield, S. and Pellegrin, N. 2007. Fish harvesting activities within the proposed Gwaii Haanas National Marine Conservation Area. Can. Manuscr. Rep. Fish. Aquat. Sci. 2803: vi + 65p.
 3 Lucas, B.G., Verrin, S. and Brown, R. (Editors). 2007. Ecosystem overview: Pacific North Coast Integrated Management Area (PNCIMA). Can. Tech. Rep. Fish. Aquat. Sci. 2667: xiii + 104p.
 4 The date ranges in the graph and map differ because the graph is taken from MacConnachie et al. (see footnote 1), but updated information was available when creating the map.

