Commercial Fisheries – Red Sea Urchin

description

The commercial red sea urchin *(Strongylocentrotus franciscanus)* dive fishery began in British Columbia in the early 1970s. Landings in the South Coast increased rapidly during the early 1980s but the North Coast did not experience this until the late 1980s. Following the 1992 season, landings stabilized primarily due to the introduction of the quota system applied by Fisheries and Oceans Canada (DFO).

The management tools of the red sea urchin fishery include: a minimum size limit, the calculation of a total allowable catch (TAC) determined using a precautionary fixed exploitation rate of two to three percent of estimated biomass, limited entry licensing, an individual quota (IQ) program in which the total quota is divided equally amongst licences, area licensing, and area quotas. Red sea urchins are fished commercially under authority of a limited licence category "ZC" or a communal commercial licence "FZC"; in total there are 110 licence eligibilities. Limited entry licensing was implemented in January 1991. Vessels are permitted to stack up to a maximum of five active licenses per vessel.

The commercial red sea urchin fishery is licensed for two geographic areas (North Coast and South Coast), and occurs in four geographic locations within those areas: West Coast Vancouver Island (Areas 20 to 27, 111, 121 and 123 to 127), East Coast Vancouver Island (Areas 11 to 19, 28 and 29), North Coast (Areas 3 to 10, 103 to 110) and the Queen Charlotte Islands (Areas 1 and 2, 101, 102 and 142) (see *www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/areas-secteurs/index-eng.htm*).

Red sea urchins are the largest of the five species of sea urchins in the Pacific Region. The use of a size limit in this fishery is considered precautionary and allows red sea urchins several years of spawning before becoming available for the commercial fishery. The minimum size limit for harvesting of red sea urchins is a 90 millimetre test diameter, measured between the spines, through the greatest diameter of the red sea urchin test (shell).

Red sea urchin is commercially harvested in relatively shallow areas with moderate to strong currents by scuba divers who remove the urchins from the ocean floor by using short aluminum hand rakes. Red sea urchins are harvested for their roe (gonad), which is extracted for commercial purposes at processing plants for shipment to fresh markets. The yield of roe from an urchin ranges from five to fifteen percent of total body weight. The fishing season runs from August 1 to July 31.

The total estimated catch (pounds) for the red sea urchin fishery was assembled by DFO into 4 kilometre x 4 kilometre grid cells directly from the Shellfish Stock Assessment harvest log database located at the Pacific Biological Station (PBS) and includes the 2000-2005 fishing seasons. The database is based on fishing events provided by fishermen. Information provided by DFO was modified to meet confidentiality requirements.

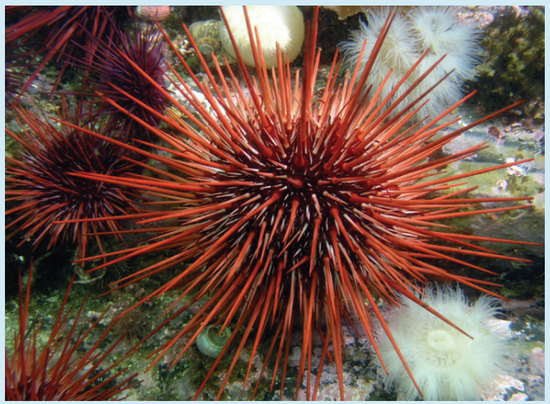

PHOTO: ED BIERMAN

The data are displayed using equal interval categories, meaning that the data are divided into 5 equally spaced classes where each class may contain a different number of grid cells. The percent of grid cells that fall in a given category is shown in the legend.

Permanent, year-round closures for the red sea urchin fishery were compiled based on the Integrated Fisheries Management Plan (IFMP) for Red Sea Urchin by Dive dated September 1, 2008 – August 31, 2009 and 2008 Fisheries Notices (up to Oct. 2, 2008). Areas identified as closures may also include areas not licensed for this fishery. (Please read caveats of use for more information on closures.)

data sources

- Fishery data: Fisheries and Oceans Canada, Shellfish Stock Assessment Harvest Log Database, Pacific Biological Station
- Year-round commercial fishing closures: Living Oceans Society (see Robb *et al.*, 2010)

data resolution

- 4 kilometre by 4 kilometre grid cells

date compiled

- Fishery data: 2000-2005
- Year-round commercial fishing closures: 2008

reviewers

- Commercial fishing industry representatives (who may or may not be experts for this specific fishery), assembled with the support of the commercial fisheries representatives on the BC Marine Conservation Analysis (BCMCA) Human Use Data Working Group.
- Fisheries and Oceans Canada data providers.

reviewer comments

- Generally reviewers wanted to see catch for longer time periods and closures that matched the time periods shown for the fishery. For example a 20 year time-frame would show the decrease in areas available to harvest urchin due to expansion of the sea otter range.
- Dive fisheries that target sedentary species (e.g. geoduck, urchins and sea cucumber) cannot be spatially compared to fisheries for species which are more mobile.

caveats of use

- In the case of discrepancies, catch information from DFO takes precedence over commercial fisheries information portrayed by BCMCA.
- This map should be interpreted as showing only where fishing has taken place; it does not represent economic valuations or biological trends. Neither should it be inferred that species are more abundant where fished and less abundant in areas closed to commercial harvest.
- Data displayed should not be assumed to match current or future conditions due to ongoing changes in the environment and management.
- Data on this fishery have been screened to meet confidentiality requirements. The count of commercial fishing vessels for each spatial unit the data are provided in must be greater than 2 for information to be made public. This screen was set for each year before data were binned across years. This map represents 96.3% of the data from this fishery that met confidentiality requirements.
- The effort expended to capture targeted species differs among fisheries. Therefore it is difficult to compare weight caught for a low volume fishery verses a high volume fishery.
- Closures illustrated are permanent, year-round closures. Seasonal, temporary and voluntary closures were not included, all of which may impact catch. Areas identified as closures may also include areas not licensed for this fishery.
- Due to a lack of available spatial data regarding fisheries closures, the time period for closures does not match the time period for catch illustrated on the map. Many of the closures were implemented after the period for which catch is shown. As a result, the map may show harvesting in the closed areas, while in reality they did not overlap in time. Because the closure data are compiled in irregular polygons, closures may overlap the square grid cells delineating areas of commercial harvesting. Harvesting does not occur consistently throughout each grid cell and may not have occurred within the closure.
- Recommended date of expiry for use of these data in a marine planning context: None provided.

map, feature data and metadata access

- Visit *www.bcmca.ca/data* for more information.

references

- BC Marine Conservation Analysis. *Workshop Report on Commercial Fisheries Data Review.* March 2010. *www.bcmca.ca/document-library*
- Fisheries and Oceans Canada. *Annual Integrated Fisheries Management Plans.* *www-ops2.pac.dfo-mpo.gc.ca/xnet/content/MPLANS/MPlans.htm?&lang=en*
- Robb C.K., K.M. Bodtker, K. Wright and J. Lash. "Commercial fisheries closures in marine protected areas on Canada's Pacific coast: The exception, not the rule." *Marine Policy* (2010), doi:10.1016/j.marpol.2010.10.010

BCMCA Atlas

Commercial Fisheries
Red Sea Urchin 2000 - 2005

Legend

Pounds of Red Sea Urchin Caught

- 3,903 - 150,000 (83.93%)
- 150,001 - 300,000 (11.79%)
- 300,001 - 450,000 (2.56%)
- 450,001 - 600,000 (1.20%)
- 600,001 - 750,000 (0.51%)
- Year-round Red Sea Urchin Closures

Notes:
- The number in brackets in the legend above is the percent of polygons that fell into the given category.
- This map represents 96.3% of the data from this fishery that meet confidentiality requirements (minimum 3 vessels reporting).
- Urchin closures obtained from the Sept. 1, 2008-Aug. 31, 2009 Integrated Fisheries Management Plan and from the 2008 Fisheries Notices to Oct. 2, 2008.

Data Sources:
Fisheries and Oceans Canada, Living Oceans Society

Base Data:
ESRI Base Data, GeoBase, GeoBC, NOAA, Natural Resources Canada, USGS, Washington State Government

Thematic Data:
For more information on data sources and methods please refer to the facing page to this map

Projection: BC Albers NAD83

0 25 50 75 100 125 150
Kilometres
0 25 50 75
Nautical Miles

1:4,250,000 *

* Written scales are approximate and are based on a 11 x 17 inch paper size.

Prepared for:

BC Marine Conservation Analysis

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Alaska
Haida Gwaii
British Columbia
Vancouver Island
Washington
PACIFIC OCEAN
Nass River
Skeena River
Fraser River

142°W 140°W 138°W 136°W 134°W 132°W 130°W 128°W 126°W 124°W 122°W
54°N 52°N 50°N 48°N 46°N

Inset Map 1:500,000*

Note: The inset has been provided to illustrate the level of detail available in the data. The inset is for illustrative purposes only and does not imply any significance to this region.