

Response to Request for Spatial Analysis of NWFSC Groundfish Bottom Trawl Survey and
West Coast Groundfish Observer Program Data
for Canary and Yelloweye Rockfish

Northwest Fisheries Science Center
May 30th, 2008

On March 28, 2008 the Northwest Fisheries Science Center received a request from Mr. John DeVore of the Pacific Fishery Management Council staff for analysis of West Coast Groundfish Observer Program (WCGOP) and NWFSC groundfish bottom trawl survey data for use by the Groundfish Management Team (GMT) in identifying areas with higher densities and higher bycatch rates of canary and yelloweye rockfish.

To fulfill this request and make additional spatial representations and discard rates available, the Northwest Fisheries Science Center in collaboration with the College of Oceanic and Atmospheric Sciences at Oregon State University has posted NWFSC bottom trawl survey and aggregated observer data for selected species on the Pacific Coast Ocean Observer System's (PaCOOS) West Coast Habitat Server (<http://pacoos.coas.oregonstate.edu/>). Map representations of groundfish bottom trawl survey and observer data are available via this portal, as well as tabular data for survey fish catch and observed discard rates. See the information below for specific details on the creation of these data products, as well as instructions on how to review and access these data products from the website.

PaCOOS data products originate from data collected by fishery observers in the West Coast Groundfish Observer Program (WCGOP), Fishery Resource Analysis and Monitoring Division (FRAM) at the Northwest Fisheries Science Center, NOAA Fisheries. The WCGOP's goal is to improve total catch estimates by collecting information on the discarded catch (fish returned overboard at-sea) of west coast groundfish species. All data were collected according to standard protocols and data quality control established by the WCGOP. The observed portion of overall catch or landings in a fishery varies by coverage level. Since all fishing operations are not observed, neither the maps nor the data can be used to characterize the fishery completely. This is especially true for rarely-occurring species and when observed sample sizes are small. We urge caution when utilizing these data due to the complexity of groundfish management and fleet harvest dynamics. Grid cells representing less than 3 vessels and less than 10 hauls or sets are not shown to preserve confidentiality and to ensure adequate sample size. In the limited-entry groundfish bottom trawl fishery, species discard rates (species discard weight / groundfish total catch (discard + retained weight)) are categorized by approximate quartile ranges and geo-referenced to 10 x 10 kilometer grid cells. The observed trawl towline (line drawn from the start to end location of a trawl tow) was used to allocate data to 10 x 10 kilometer grid cells for calculation. In the limited-entry fixed gear fishery, species discard rates (species discard weight / groundfish total catch (discard + retained weight)) are categorized by approximate quartile ranges and geo-referenced to 20 x 20 kilometer grid cells. The observed fixed gear set location (start location of fishing) was used to allocate data to 20 x 20 kilometer grid cells for calculation. Seventeen species in the bottom trawl fishery and sixteen species in the fixed gear fishery are

represented based on combined observer data from 2002-2006. The species included are dover sole (*Microstomus pacificus*), sablefish (*Anoplopoma fimbria*), longspine thornyhead (*Sebastolobus altivelis*), shortspine thornyhead (*Sebastolobus alascanus*), lingcod (*Ophiodon elongatus*), arrowtooth flounder (*Atheresthes stomias*), english sole (*Parophrys vetulus*), petrale sole (*Eopsetta jordani*), and the rockfishes (genus *Sebastes*), darkblotched rockfish (*S. crameri*), Pacific ocean perch (*S. alutus*), chilipepper (*S. goodei*), cowcod (*S. levis*), bocaccio (*S. paucispinis*), canary rockfish (*S. pinniger*), widow rockfish (*S. entomelas*), yelloweye rockfish (*S. ruberrimus*), and yellowtail rockfish (*S. flavidus*). Tabular data available for download within the PaCOOS application provide data fields identifying the fishery, data years, scientific name and common name for each species; a coded identifier, center latitude, and center longitude for each grid cell; and a discard rate for each species within each grid cell.

Selected catch data from the NWFSC West Coast Groundfish Trawl Survey were extracted and formatted for inclusion in the Pacific Coast Ocean Observing System (PaCOOS) West Coast Habitat Portal. This ongoing series of annual surveys is designed to monitor long-term trends in distribution and abundance of west coast groundfish, especially those species of management concern, along the entire continental U.S. West Coast. Effort-normalized catch weights (catch per unit effort in kilograms per square meter), categorized by approximate quartile catch ranges for each species within a survey year and geo-referenced to the sample trawl location, were provided to meet the requirements for spatial display. Geo-referenced catch ranges for eleven species were included in the data product. These catch weight ranges and associated trawl locations are also available by download within the PaCOOS application. The species included for the years 2003-2005 are dover sole (*Microstomus pacificus*), sablefish (*Anoplopoma fimbria*), longspine thornyhead (*Sebastolobus altivelis*), shortspine thornyhead (*Sebastolobus alascanus*), arrowtooth flounder (*Atheresthes stomias*), english sole (*Parophrys vetulus*), petrale sole (*Eopsetta jordani*), and the rockfishes (genus *Sebastes*), darkblotched rockfish (*S. crameri*), Pacific ocean perch (*S. alutus*), chilipepper (*S. goodei*), cowcod (*S. levis*), bocaccio (*S. paucispinis*), widow rockfish (*S. entomelas*), yelloweye rockfish (*S. ruberrimus*), and yellowtail rockfish (*S. flavidus*).

General Guidelines for Review of PaCOOS Observer and Survey Data Products

Start at the main PaCOOS website: <http://pacoos.coas.oregonstate.edu/>.

Under the Help tab, tutorials are available for assistance with general navigation of the site, and how to use the data portal and fish viewer.

To review the species maps, click the Launch button under Map Viewer. In the Table of Contents, select the white check box for Fish and Invertebrate Data, then the FRAM Groundfish Survey data by year and then species, and finally by clicking on the white check box to the left of the species common name. In the Table of Contents, select the white check box for Fish and Invertebrate Data, then the FRAM Observer Data for Fixed Gear or Trawl Gear and then species, and finally by clicking on the white check box to the left of the species common name.

To see the legend for each species, right click on the species name and the values for the map representation will appear in a small window.

To see metadata for each of these layers, left click once on the species name and a window will appear with metadata. To see the legend for each species, right click on the species name.

To select specific grid cells or survey data locations, left click once on the button with (+?) next to the species common name, then place the cursor over the map and drag a bounding box (of interest) on the map with the right mouse button. A window will appear with the specific tabular information for the selection. This selection process can be made on multiple layers if desired (by checking the Allow Multiple? box under Query Layers in the Table of Contents), with multiple tabs for each layer showing in the tabular information window. This step allows a user to more easily work with both the map representations and tabular data from downloads.

To review or download the tabular data associated with each data product, begin at the main PaCOOS website and click the Launch button under the Fish Viewer tab. Now click the Download Data link in the upper right hand corner of the view. The view will now include links to download data as MS Excel (csv) files, Adobe PDF files, and either OPeNDAP binary or ASCII Text objects. Links are available for Groundfish Survey 2003-2006, Observer Fixed Gear 2002-2006, and Observer Trawl 2002-2006, as well as other data in PaCOOS.

To review or copy and paste text from the metadata associated with each data product, begin at the main PaCOOS website and select the OPeNDAP tab. Then select the Information button under either Groundfish Survey or West Coast Groundfish Observer Program, to review the data field column descriptions and metadata text.