

May I now present the Russian proposals to BAPIS program designed pursuant to the Central Bering Sea pollock workshop on allowable harvest level and stock identification (para 12.2 of the Protocol) held last June in Seattle.

Goals and objectives

This study is aimed at assessing the Bering Sea pelagic concentrations of pollock, and the role of pollock within the currently existing ecosystems.

This is to be achieved through accomplishing some specific tasks as given below.

1. Assess the present biomass of pollock concentrations in the Aleutian and Commander Basins.
2. Measure up the polymorphism of genetic markers in pollock at different geographical sites of the Bering Sea.
3. Survey water circulation and dynamics in the Aleutian basin.
4. Use the confidence data on the population structure of the Bering Sea pollock, and on the importance of the coastal stocks for the formation of concentrations in the Aleutian Basin for annual evaluation of characteristics as given below (for each stock):
  - spawning intensity;
  - recruitment by year classes;
  - age/sex structure of the spawning and fishing stocks.

5. Assess the role of the Aleutian Basin pollock within the Bering Sea ecosystem

The activities which Russia could perform under the International Program BAPIS are follows.

Regular trawl surveys shall be conducted to collect biological, genetic and physiological data. Depending on the season and pollock distribution pattern this work is to be done using midwater and bottom trawls.

The grid of stations is shown in Figure 1. It was designed with due regard to the present day concept concerning the migratory routes of pollock within the Donut Hole and the adjacent waters of Bering Sea. In total, the trawl survey will include 67 stations of which 34 hauls will be made in the Convention Area (Donut Hole) of the Bering Sea. The range surveyed will cover the waters off Medny Island, Shirshov ridge area, the southern and northern parts of the Aleutian basin, and a part of the Navarin Region.

The ichthyoplankton survey shall be made in spring time once a year. Its specific timing is dependent on the ice conditions of the year and the expected time of spawning within the said time interval.

The survey will be done using a station grid shown in Figure 1. There will be 41 stations including 29 at the site between Medny Island and Olutor cape, 8 in the southeast of the Donut Hole, and 4 in Navarin Region. Should it be impossible to accomplish stations at the points shown in the grid because of heavy ice conditions the survey stations will have to be shifted most closely to the ice edge.

Ichthyoplankton samples will be collected with IKS-80 net according to the standard techniques. Vertical hauls between 500 m and surface will be made; at lesser depths it will be between the bottom and surface. The angle of line tilt will be accounted for so that the net is set to the desired stratum, or when the swept water volume is calculated.

The ichthyoplankton hauls shall be combined with hydrological stations. Remote sensing data show the actual submersion depth of the net.

The echointegration surveys are targeted at finding out the population attributes of bathymetric distribution and regularities in forming pelagic concentrations of pollock going out to the Aleutian and Commander Basins; another target is to evaluate the biomass of the pelagic and near-bottom concentrations of pollock in the Central Bering Sea and adjacent regions. Acoustic studies are made once in spring at the site between Medny Island and Olutor cape, and in Navarin Region. The overall length of the acoustic survey tracks is 651 nautical miles of which 571 mile portion is the stretch between Medny Island and Olutor cape.

Hydrometeorology is to be studied to track down the impact of habitat condition, and to identify the key factors which influence the formation of fishing concentrations and set up the spawning, feeding and wintering migration routes, and egg/larvae transport trajectories. Another objective is to monitor the hydrological characteristics of pollock biotopes at stages of their development on individual level. The hydrometeorology research includes gathering of data on the physical system of the sea.

This type of work is to be done concurrently with the trawl and ichthyoplankton surveys.

The 0-1500 m, or 0-bottom layer, are to be examined where temperature and salinity data from standard layers is to be collected.

The hydrology data obtained shall be entered in the computer database, primarily processed and mapped. The work in hydrology shall be done according to the existing guidelines.

Meteorology research will include daily observations at least once a day, as follows:

- analysis of the near earth weather maps;
- visual observations of the cloudiness and sea surface condition;
- recording of the air and sea surface temperature (SST), force and direction of winds, direction and velocity of currents by Doppler lag.

Fax and E-maps (land weather analysis, ten-day maps of water temperature and currents) shall be received by the radio operator of the vessel. Weather observations shall be made using one weather station on board, concurrently with visual observations.

In – between the specialized activities, i.e. trawl, ichthyoplankton, echointegration and hydrological surveys vessels operate in scientific and fish-finding regime in order to detect individual concentrations and find out position, and for monitoring of seasonal redistribution of pollock and other species. Trawl and fishing hauls are made all across the range of research, depending on the actual situation. Similarly to trawl surveys, the catches are also analyzed which must involve ichthyological examination.

Specimens for genetic studies are selected once a year during spawning, or at the time closest to spawning. These specimens come from pollock taken in the region of Shirshov ridge, Medny Island, Donut Hole, and Navarin. Complete biological analysis must follow in respect of all individual pollock sampled for genetic analysis.

The study of pollock in the Central Bering Sea and adjacent waters will strengthen confidence of its stock condition assessment, and improve the quality of forecasts. The study of ecosystem restructuring and response of pollock to the climatic and oceanographic variability will make it possible to find out the long-range trends in the species' reproduction and abundance dynamics, and regularities in the formation of pelagic concentrations in the basins of the Bering Sea.

It is expected that the implementation of this program will enable us to obtain:

1. Actual status estimates for pelagic concentrations of pollock of the Aleutian basin and adjacent waters; short- and long-range trends in their abundance and density variations.
2. Data on seasonal distribution of the pelagic pollock concentrations, as dependent on various habitat parameters and the condition of inshore stocks.
3. Appraisal of the vectors of restructuring in the Bering Sea ecosystem, and of the species' response to the weather and ocean variability in the region.
4. Knowledge of the actual general pattern of the population (and, if possible, subpopulation) structure of pollock in the Bering Sea.
5. Information on the range of individual populations of pollock in the Bering Sea; direction and extent of the spawning, feeding and wintering migrations; timing of departure and entry of pollock to the Donut Hole.