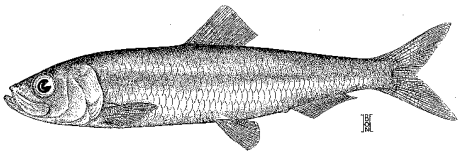
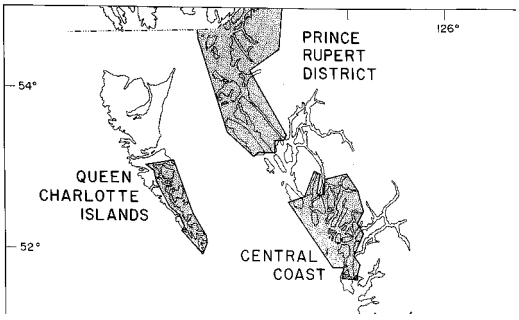
Fisheries and Oceans / Pêches et Océans
Pacific Region

DFO Science
Stock Status Report B6-02



Central Coast Herring



Background

Pacific herring is a pelagic species which occurs in inshore and offshore waters of the North Pacific. In the eastern Pacific it ranges from California to the Beaufort Sea. Herring mature and recruit to the spawning stock predominantly between ages 2 to 5. Within this range, age-at-recruitment tends to increase with latitude.

The Central Coast herring stock is one of five major B. C. herring stocks. Between 1896 and 1936 the catch from this stock averaged 131 t, used mainly for bait. The reduction fishery expanded into the Central Coast in the late 1930s. Catches averaged 35200 t between 1937 and 1967 when the stock collapsed from overfishing. The commercial reduction fishery was closed. Following a combination of favourable environmental conditions and a low harvest rate, the stock recovered by the mid-1970s. The current roe fishery began in 1972. The target harvest rate of roe herring is fixed at 20% of the forecast mature stock biomass, when stock size is sufficiently above the threshold or minimum spawning stock biomass (Cutoff). The stock achieved recent high abundance levels in the early 1990s and has declined recently. The 1996 assessment forecasts indicate that the mature herring biomass for the coming season is 20,730 t. This is 3130 t above the stock conservation reference point (17,600 t).

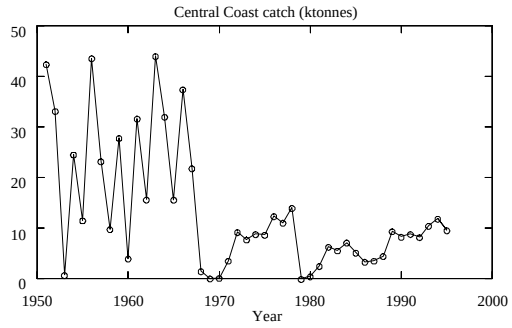
The Fishery

Average Central Coast Catch (ktonnes)

1951-60	1961-70	1971-80	1981-90
22.1	20.0	7.6	5.6

From the late-1930s until the late 1960s, most herring were harvested and processed (reduced) into relatively low value products such as fish meal and oil. Commercial harvest rates increased progressively and were unsustainable by the early 1960s. By 1965, most of the older fish had been removed from the spawning population by a combination of overfishing, and a sequence of weak year-classes, attributed to unfavourable environmental conditions and a low spawning biomass. Consequently, the commercial fishery collapsed in 1967, and was closed by the federal government to allow the stock to recover.

After a four year closure and a fortuitous return of favourable environmental conditions, the stock rebuilt enough to sustain a new fishery. There was a growing interest to harvest roe herring for export to Japan. A small experimental roe harvest began in 1972, and the fishery expanded until 1983, when fixed quotas were introduced to regulate the catch. Small quantities of Central Coast herring are also utilized for spawn-on-kelp, and aboriginal food fish. The objective of the roe herring fishery is to obtain a low volume, high-quality product that is economically profitable and ecologically sustainable.



The fishery is currently managed by setting a fixed target harvest rate of 20% of the forecast mature stock biomass. To meet conservation objectives, the management strategy also enforces a minimum spawning stock biomass. If the forecast biomass falls below the Cutoff threshold (17,600 t) the commercial fishery is closed until the stock rebuilds (Stocker 1993). In response to reduced stock levels the Central Coast fishery was closed in 1979 and 1980. Since then the stock rebuilt to a peak abundance in 1989 and has sustained an average catch of 7800 t over the past decade. Recent catch levels for this stock have been:

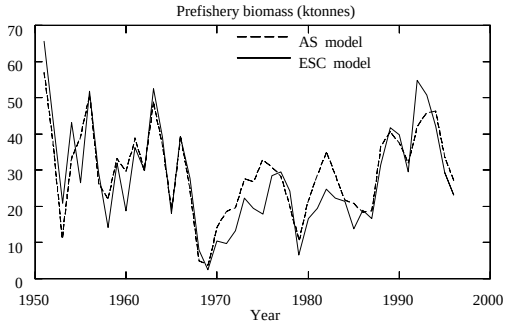
Central Coast Catch (ktonnes)

1992	1993	1994	1995	1996
8.8	11.1	12.4	10.4	5.2

Resource Status

Herring stock assessments are based on biological samples of the population age composition, average weight-at-age, historical catch data, and assessments of spawn distribution and intensity throughout the coast (Schweigert et al. 1996).

The fishable stock biomass is estimated by two models: an age-structured model and an escapement model. The latter relies predominantly on spawn estimates. The average of the estimates for both models is used to determine the current stock level, project future run size, and forecast an allowable catch.



Recent trends show that the Central Coast herring stock declined from 48,500 t in 1992 to 25,100 t in 1995. The forecast pre-fishery biomass for 1997 is 20,730 t.

Outlook

The Central Coast stock reached near historic high levels of abundance in the late 1980s and early 1990s. This was due to the unusually strong 1985 and 1989 year classes recruiting to the stock.

Subsequently, the stock has declined as poorer recruitments have occurred over the past four years. Unless additional strong recruitments occur, the stock will remain at current levels or decline slightly. Another poor recruitment in 1997 could bring the stock below the Cutoff level in 1998 and result in a possible fishery closure.

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References

Schweigert, J. F., C. Fort and L Hamer. 1996. Stock assessments for British Columbia herring in 1996 and forecasts of the potential catch in 1996. Can. Tech. Rep. Fish. Aquat. Sci. 2098: 66p.

Stocker, M. 1993. Recent management of the B. C. Herring fishery, p. 267-293. *In* L. S. Parsons and W. H. Lear (eds.) Perspectives on Canadian marine resource management. Can. Bull. Fish. Aquat. Sci. 226.