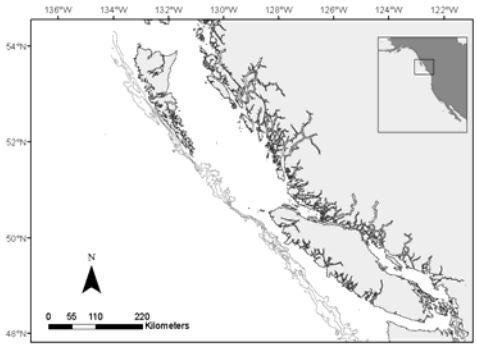

Allowable Harm Assessment for Bocaccio

Background

Bocaccio was assessed as "threatened" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in November 2002 and is currently under consideration for listing under SARA. A final listing decision will be made by Governor in Council in October 2005. If bocaccio is listed, the prohibitions associated with SARA will come into force in October 2005. If listing occurs, SARA will provide legal protection to this population and requires the development of a recovery strategy and action plan. In the absence of a recovery strategy, SARA provides that the Minister of Fisheries and Oceans may issue a permit to allow for incidental harm to a listed species if a number of conditions are met. Under section 73(2), authorizations may only be issued if:

a) the activity is scientific research relating to the conservation of the species and conducted by qualified persons;
b) the activity benefits the species or is required to enhance its chance of survival in the wild; or
c) affecting the species is incidental to the carrying out of the activity.

Section 73(3) establishes that authorizations may be issued only if the competent minister is of the opinion that:

a) all reasonable alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted;
b) all feasible measures will be taken to minimize the impact of the activity on the species or its critical habitat or the residences of its individuals; and
c) the activity will not jeopardize the survival or recovery of the species.

The analysis provided herein will support the Minister of Fisheries and Oceans in determining the basis under which permits are to be issued in Canadian waters. In the context of this status report, "harm" refers to all prohibitions as defined in SARA.

Summary

- This evaluation determined that there is scope for human induced mortality without jeopardizing survival or recovery of bocaccio in B.C. waters.

- Survey indices of bocaccio in British Columbia waters rose from a stable period in the late 1970s to higher levels in the early 1980s then declined. Survey indices imply that current abundance may be about 25-100% of the abundance observed in the late 1970s, depending on how the indices are interpreted.

- Commercial bottom trawl catch rates are not reliable prior to 1996 and appear to be stable after that date. The interpretation of recent trends in the survey data is difficult due to the high level of uncertainty inherent in the relative biomass estimates for this species. Possible interpretations of the current data range from no detectable change since 1990 to the suggestion that indices since 2000 are less than half the level observed in the 1990s. Commercial and research catches from a variety of gear types indicate that the distribution of bocaccio is widespread over the continental shelf. Fishing activities

also indicate a presence in enclosed waters and inlets.

- Recent annual catch (retained and discarded) in B.C. waters is 300-330 t, of which about 90% is taken by commercial trawl fisheries. Most of the remainder is taken by commercial hook-and-line fishing. Negligible amounts may be taken by recreational and First Nations sectors. Virtually all catches are made while targeting on other species.

- Recent catch levels in B.C. were determined to be low enough that they did not place recovery of the stock in jeopardy over the permitting period. Furthermore, U.S. harvests, which may have contributed to the decline in B.C. waters, have already been significantly reduced.

- Catches are well monitored in the commercial trawl fishery by a 100% at-sea observer program. Observer coverage in the commercial hook-and-line sector is currently at 10-20%, but is expected to reach much higher levels within two years. Both sectors have 100% dockside monitoring.

- Mitigative measures were voluntarily adopted in the commercial trawl fishery beginning with the 2004/2005 fishing year (April-March). Preliminary results indicate that these measures are reducing incidental catches in the trawl fishery significantly compared to recent catch levels. Measures to reduce catches are under consideration for the commercial hook-and-line fisheries.

Issue

COSEWIC noted the general decline of bocaccio (*Sebastes paucispinis*) abundance in two bottom trawl surveys off the southwest coast of Vancouver Island over the last three decades and assessed the population as "threatened". The total decline over the period was sufficient to meet the criterion of "endangered" but owing to the limited spatial coverage of the surveys, a "threatened" listing was selected.

Specific threats cited by COSEWIC were overfishing and a period of poor recruitment, although no causality has been established between fishing and the decline for B.C. waters.

In respect to SARA Sect. 73, a scientific evaluation was conducted to identify potential sources of harm and to determine a level of incidental harm, if any, that would not jeopardize survival or recovery of bocaccio. This was done to support advice to the Minister of Fisheries and Oceans concerning SARA preconditions, primarily that the incidental harm would not threaten the survival and recovery of the species in B.C. waters.

Assessment of Issue

Description of the Species

Bocaccio is one of over 35 species of rockfish found in marine waters off B.C. Other common names for bocaccio include rock salmon, salmon rockfish, Pacific red snapper, Pacific snapper, and Oregon snapper. Bocaccio is treated as one population in B.C. waters. The population of bocaccio it regarded as one COSEWIC Designatable Unit in B.C. waters, but there has been no formal research to address stock delineation in B.C.

The species is found in coastal waters of the eastern Pacific Ocean from the Gulf of Alaska to Baja California, Mexico. The population of bocaccio in B.C. probably overlaps to some extent with U.S. populations to the north and the south.

Most B.C. catches come from the outer Pacific coast near the edge of the continental shelf, with the largest catches coming from the southwest coast of Vancouver Island and Queen Charlotte Sound. They have also

been reported from numerous inlets and the Strait of Georgia.

Bocaccio are livebearers. Fecundity ranges from 20,000-2,300,000 larvae. Copulation occurs in the early fall but fertilization is delayed; live young are released in the winter. Settlement to the nearshore and demersal habitat extends from late spring through the summer. Larvae are approximately 4-5 mm in length at release and then metamorphose into pelagic juveniles over the next several months. Bocaccio are thought to mature at 4 to 5 years of age and can reach a maximum weight of about 9 kg and a maximum length of over 90 cm. Females tend to be larger than males. Maximum age probably exceeds 50 years.

Total estimated catch of bocaccio in B.C. waters has averaged about 300-330 t/y in recent years (1996-2003). Most (90%) of these catches are taken by the commercial trawl fishery which presently has 100% at-sea observer coverage. Most of the remaining 10% is taken by the commercial hook-line-sector. Catches come from the entire edge of the continental shelf from the Washington to Alaska borders.

Species Status

COSEWIC assessed bocaccio as threatened in November 2002 citing declines in two surveys off the west coast of Vancouver Island. Depending on the survey, the decline appears to have ceased or has at least slowed down since the mid 1990s. Results in one of these surveys also indicated a lower period of abundance in 1975-1979, the earliest available record for bocaccio in B.C. waters. This structure in the time series was not emphasized in previous documents or the COSEWIC status report. Current status, relative to the earliest period, would suggest that current abundance is 25-100% of the levels seen in the late 1970s.

Scope for Human-Induced Mortality

The absolute abundance of bocaccio in B.C. waters is unknown. Current catches are about 300-330 t/y, which translates to a catch of about 70-80,000 specimens a year. Most of these are mature or near mature, thus it can be assumed that many hundreds of thousands of late juvenile or adult specimens are present in B.C. waters, perhaps more than a million. Given the recent stability in abundance and the widespread distribution, extirpation does not appear to be an immediate concern

Maximum Sustainable Mortality

A review of all survey evidence suggested that the bocaccio population in B.C. may be at a lower risk that assessed by COSEWIC but a more precautionary approach may be warranted given that:

- bocaccio abundance is at the lowest point in all the time series;
- there is evidence for a pronounced decline since 1980 from California to northern B.C.;
- the poor recruitment for most groundfish species during the 1990s provides a mechanism for a decline.

It therefore is reasonable to propose measures designed to increase current abundance on the order of a doubling or tripling from current levels. However, there does not seem to be a need for a strategy that targets a return to the peak levels observed in the early 1980s.

For the short term, current levels of mortality for bocaccio should be kept below or near current levels. If the abundance changes, up or down, regulations can be adjusted accordingly.

Potential Sources of Mortality and Aggregate Harm

Capture in commercial fisheries is the primary source of human induced mortality for bocaccio. Other potential sources of harm (habitat alteration, oil exploration and production, pollution, shipping, cables and lines, military activities, ecotourism, and scientific research) are currently considered to have negligible impacts on the ability of the population of bocaccio to survive and recover.

Alternatives to Activities

The commercial trawl and hook-and-line fisheries, and the recreational and First Nations all catch bocaccio, although the latter two sectors account for negligible amounts. Most of the catch of bocaccio is non-directed and bocaccio are similar in behaviour and size to some common target species. Thus, there is no obvious means for reducing catches of bocaccio by switching to entirely different harvesting strategies.

Feasible Mitigation Measures

If required, it is feasible to reduce bocaccio catches in the various groundfish sectors. The capacity to do this has already been demonstrated in the commercial trawl fleet which has significantly reduced its catches of other finfish species in response to reductions in the corresponding TAC's. Furthermore, trawl fishers in 2004/2005 have voluntarily agreed not to sell any catch of bocaccio. This measure has already led to a significant reduction in the catch (landings plus discards) of bocaccio at the midpoint of this fishing year.

These measures rely on adequate monitoring of catches. Full (100%) dockside monitoring for all sectors was implemented in 1994. Full at-sea observer coverage was implemented in 1996 for the trawl fishery and Individual Vessel Quotas (IVQ's) were introduced in the trawl fleet in 1997. Observer coverage is currently at about 10-20% in the hook-and-line sector and will be increased significantly in the next two years. Accurate monitoring is essential for determining the impact of the mitigation measures to reduce catch.

Expected Mortality

Mortality will be equal to monitored catch in the commercial groundfish sectors. Since the quotas for target trawl species are not expected to change in the short term, fishing effort should remain constant at present levels, and thus catches of bocaccio should vary in response to changes in bocaccio abundance unless disincentives are implemented to reduce the catch of bocaccio.

Rationale for Permitting

The number of adults present and their widespread distribution, the recent stability in catch rates concurrent with catches of 300-330 t, and the observation that current abundance may be 25-100% of earliest known or mean abundance, suggest that the current mortalities do not appear to jeopardize the survival or recovery of bocaccio in B.C. waters over the short term.

Sources of Uncertainty

The actual biomass of bocaccio will remain unknown for the foreseeable future; there is also uncertainty in the estimation of the amount of decline from the earliest record in the surveys. However, catches are presently accurately monitored, and a number of new surveys capable of monitoring bocaccio have been, or are in the process of being, initiated. These initiatives should provide adequate monitoring of the B. C. population of bocaccio in the future.

Conclusion

Given that mortality due to fishing is considered the dominant source of mortality for bocaccio, and that the recent population trend is reasonably stable prior to any constraints on catch, it appears that the recent level of mortality will not impair the ability of the population to rebound from the current low point in abundance. However, over the longer term, it is advisable to increase the likelihood and the potential rate of recovery by reducing catches from the levels observed in the late 1990s and the early 2000s. It has already been demonstrated that catches can be reduced in the commercial trawl fleet by removing incentives or implementing catch disincentives. Furthermore, current catch monitoring in this fleet is sufficiently accurate to determine the effectiveness of such management actions to reduce catch.

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For More Information

Contact: Rick Stanley
Fisheries and Oceans, Canada
Pacific Biological Station
Nanaimo, B.C. V9T 6N7
Tel: 250-756-7134
Fax: 250-756-7053
E-Mail: stanleyr@pac.dfo-mpo.gc.ca

This report is available from the:

PSARC Secretariat
Pacific Biological Station
Nanaimo BC V9T 6N7

Telephone: 250-756-7208
FAX: 250-756-7209
E-Mail: PSARC@pac.dfo-mpo.gc.ca
Internet Address: www.dfo-mpo.gc.ca/csas

ISSN 1480-4913 (Printed)

La version française est disponible à l'adresse ci-dessus.

Correct citation for this publication

DFO, 2004. Allowable Harm Assessment for Bocaccio. DFO Can. Sci. Advis. Sec. Stock Status Report 2004/043.