

FISHERIES DIVERSIFICATION PROGRAM

Environmental Awareness and Conservation Technology

Project Summary: EACT- 4.2001.DFO (FDP 334)

Gear and By-catch Concerns: Interactions in the Turbot, Crab and Shrimp Fisheries in 2J3KL

On February 27-28, 2001, a workshop was held in Gander to discuss three important fisheries issues: 1. turbot and cod by-catches in shrimp otter trawls - 2. impact of otter trawling technology on snow crab stocks - 3. snow crab by-catch in turbot gillnets. A total of 85 persons participated in the workshop, representing The Department of Fisheries and Oceans, the provincial Department of Fisheries and Aquaculture, the Fishery, Food and Allied Workers Union, the Fisheries Association of Newfoundland and Labrador, the Canadian Centre for Fisheries Innovation, the Newfoundland Association of Co-ops, aboriginal groups, individual processors, and the four harvesting fleet sectors (under 35', 35' -64'11", 65' - 100', and over100'). Prior to the workshop a discussion paper - "Crab-Shrimp- Turbot Interactions" - was circulated to participants, to assist in focusing on the issues. For each of the three workshop segments, DFO staff presented available data and plenary discussions were held. Following discussions, an action plan, including proposed management measures for 2001 and additional study of the issues, was developed for each segment.

TURBOT/COD BY-CATCH IN SHRIMP OTTER TRAWLS

DFO scientist Geoff Perry, A/Dir. , Aquatic Resources, Science Sector, made a presentation outlining Observer information and coverage; distributions of redfish, turbot and cod in the shrimp fishing areas; by-catch estimates and; impacts of by-catches on turbot and redfish stocks.

Discussion: Participants felt that a similar analysis for cod by-catch should be conducted. They expressed concern over the small size of the turbot taken as by- catch. DFO science representatives noted that this should not be a concern, as there would be many millions of small fish available in any good year class. Some participants felt that data should be analyzed to compare by-catch characteristics of the two types of footgear - roller and rockhopper - used in the shrimp fishery.

Conclusion: It was concluded that by-catch of turbot and cod in the shrimp otter trawl fishery is not a significant problem at this point.

Action Plan:

- Continue to monitor the incidence of all by-catch in the shrimp fishery, using all available sources of information.
- Conduct lost-yield analysis for cod, as has been done for turbot and redfish.
- Consider the possibility of conducting experiments to compare by-catches in shrimp trawls using rockhopper footgear with by-catches in trawls using bobbin (roller) footgear.

DAMAGE TO CRAB STOCKS USING SHRIMP OTTER TRAWLING TECHNOLOGY

Gerry Brothers, Coordinator - Conservation and Technology, DFO Fisheries Management Sector, summarized a project conducted in 2000 to investigate

possible damage to crab by otter trawling technology. For the project, a fishing experiment (the first phase of a two-phase project) was conducted in NAFO Division 3K, in the La Scie area, in which fishing alternated between crab pot fishing and shrimp otter trawling in the same area. Results indicated little impact on crab stocks from shrimp trawling. A ten-minute video, taken in an area of low crab density, showed the interaction of a shrimp trawl with the sea floor. A design for a modified shrimp trawl, with collection bags to retain species passed over by regular footgear, was presented and discussed. This gear will be tested at sea in 2001. It is expected to be a more effective tool in efforts to assess possible damage to crab.

Discussion: Participants felt that areas where such studies are conducted should include grounds that are subject to intensive trawling and areas with significant concentrations of crab. Shrimp fishers operating in the Gulf of St. Lawrence said they didn't find crab in their catches or meshed in their trawls in past years, before the introduction of grates. It was suggested that roller gear is more friendly towards crab than rockhopper gear, and that comparative fishing should be conducted to test this. It was agreed that the impact of shrimp trawling on the seabed and the marine ecosystem is not well understood, and that the cause of decline in the crab stock is not known. Continued research and investigation were recommended.

Labrador fishers said a high incidence of broken crab landed in their area suggested there is a problem. They said also there is some evidence of small crab being taken in the shrimp fishery. Their crab stocks have declined, and there are only a few areas where crab are concentrated. They felt that these areas should be closed to otter trawling. They suggested that greater use should be made of observer data, and that grading reports should be analysed to compare landed crab grades in areas of high otter trawl activity - eg. 3K - to grades in areas with low activity - 3L. It was noted that crab may also be damaged through poor handling, and that fishing in cold water appears to contribute to leg loss.

Conclusion: Participants agreed that observations by researchers in controlled fishing experiments and by fishers with years of experience in the Gulf of St. Lawrence shrimp fishery indicate that shrimp otter trawling has little impact on the crab resource.

Participants also agreed, however, that certain other observations may suggest some impact. Two observations are particularly notable: (1) Based on fishers' reports (not supported by recorded data), there appears to be more crab with parts missing showing

up at plants in NAFO Division 2J; (2) Crab stocks in the north, where most shrimp fishing occurs, appear to be declining faster than those in the south.

Action Plan:

- Complete the second phase of the controlled fishing experiment carried out off La Scie, and use from phase 11 to complete additional video filming of the shrimp trawl in action, in an area of substantial crab density.
- Examine Tavel Ltd. grading data to compare the percentages of broken crab landed in different areas.
- Review the observer data base for incidents of crab by-catch, both inshore and offshore.
- Conduct comparisons of shrimp trawl rockhopper and bobbin gear in regard to their interaction with the bottom and their levels of by-catch.
- Review available food/feeding studies of turbot, cod and seals to determine potential snow crab consumption.
- Develop onboard handling systems for quick and easy release of undersized, soft-shelled, and female crabs caught incidentally in pots.
- Review DFO research survey data for snow crab by-catch; review the literature on the impacts of trawling on the various seabed life forms.

Fisheries Management:

- Conduct this year a pilot project in 2J to determine the impact of shrimp trawling on crab in this area. A limited no-trawling area would be established for this purpose, in consultation with 2J crab fishers and inshore/offshore shrimp fishers.

SNOW CRAB BY-CATCH IN TURBOT GILLNETS

This issue received the most attention. Resource Management Director Roy Russell presented figures illustrating the potential impact of significant crab by-catch in the turbot gillnet fishery:

- Assuming that turbot vessels use, on average, 200 nets per vessel, and that there is a by-catch of one to three crabs per net for each day the nets are in the water (for a total of 30 days per season) - the turbot gillnet fishery could be resulting in the discard of 1000 to 2000 tonnes of crab in one season of fishing.
- This represents a potential loss of crab worth \$6.4 million to \$19.2 million. (The lower of these two figures equals nearly half the total landed value of turbot in 2000.)

Discussion: While questioning some of the assumptions made in the by-catch illustration, industry representatives nevertheless accepted the basic picture drawn. Participants said that Observers should be instructed to monitor for crab in gillnets, and that Observer deployment should provide for coverage over the entire fishing area.

Concern was expressed that the inshore commercial turbot gillnet fishery (at depths less than 350 fathoms) targets primarily juvenile fish. On the other hand, participants said the relative amounts of crab eaten by turbot, other ground fish and seals need to be considered, noting that a turbot fishery may be needed to balance the system. Many fishers noted that it is unlikely that turbot fishing areas can be separated from crab fishing areas, as both species tend to prefer soft bottom.

Much of the discussion focused on whether or not there should be a turbot fishery inside of 350 fathoms in 2001, and the style of such a fishery if one were to be conducted. It was agreed that all fishers who would be impacted by a turbot fishery should be consulted on this issue.

Discussion of putting in place a crab by-catch limit of ten per cent concluded that it would be very difficult to implement and manage such a measure, requiring test fisheries to begin with. Many participants expressed the view that it is impossible to direct for turbot with gillnets on most of the northeast coast without experiencing a high crab by-catch. Some fishers felt that any test fisheries should be conducted by experienced turbot fishers. Several responsible fishing measures to reduce by-catches were discussed, including shorter soak times, adding floats to headlines, and using stronger headropes and shallower nets. It was felt that while these measures might reduce crab by-catch, there is not enough information to say that these measures would be the solution to the problem.

It was agreed that crab by-catch is not significant in water deeper than 350 fathoms - where larger, more valuable turbot are caught - and that a longline fishery would preclude any crab by-catch at all. However, the idea of more fishers getting into deepwater longline fishing for turbot brought expressions of other concerns, including: many fishers' inexperience with longlines, the cost of bait, and low catch rates. It was recognized that some fishers, particularly those operating smaller vessels, depend on turbot gillnetting for most of their income and many have invested heavily in gear for that fishery.

Conclusions: There was clear consensus on several issues:

- There is a serious problem with snow crab by-catch in the turbot gillnet fishery in water depths less than 350 fathoms.
- Maintaining the status quo in 2001 is unacceptable; crab by-catch levels must be reduced.
- There is very little crab by-catch problem at depths greater than 350 fathoms.
- The solution to the problem should not include a complete closure of the turbot fishery.
- Any measures adopted should apply only in 2001, and should be reviewed before the 2002 fishery.

Action Plan

- More consistent Observer deployment in the turbot gillnet fishery in 2001.

Fisheries Management (2001): Three options were discussed; neither received consensus support.

Option 1 (Proposed by DFO)

- Implement the following snow crab by-catch protocol in all crab management areas:
 - Turbot gillnetting at depths less than 350 fathoms to open only after test fishing to ensure crab by-catch is under 10%.
 - Closure to occur if crab by-catch goes over 10%.
 - Closure to last at least 14 days.
 - After 14 days, conduct test fishing (industry-funded) to re-assess crab by-catch levels.
- Turbot gillnetting deeper than 350 fathoms permitted at start of season.
- Turbot longlining permitted in all areas at start of season.
- Mandatory tagging of all turbot nets in all areas.
- Set maximum numbers of nets allowed to:
 - Deeper than 350 fathoms: 500 nets
 - Shoaler than 350 fathoms: 150 nets
 - Inshore areas (to be defined): 30 nets
- Responsible fishing practices to help minimize crab by-catch:
 - Floated nets
 - Gear set shoal
 - Shorter soak time.

Option 2 (proposed by FANL)

- Fishery shoaler than 350 fathoms to be conducted by hook and line only.
- Fishery deeper than 350 fathoms to be conducted as in 2000.

Option 3 (proposed by 3K Action Committee)

- Crab fishers in any area to determine by vote whether a turbot gillnet fishery would open in areas where they have crab allocations. (There was considerable debate on whether the vote should be conducted by crab fishers in a specific area, or by all groundfish licence holders who may be impacted by these types of restrictions.)

After considerable discussion, the most acceptable approach to most participants seemed to be a combination of Options 1 and 2: the season to start

with a hook and line fishery only, and test fishing to occur upon request from fishermen in specific areas. Where a test fishery is conducted, the appropriate measures in Option 1 would apply. In many crab fishing areas, if fishermen do not request a turbot gillnet fishery, only longlining for turbot would be permitted throughout the entire season.

DFO agreed to summarize the discussions and distribute a proposal combining elements of the options to workshop participants for feedback.

Partner/Contributors:

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The \$10 million Fisheries Diversification Program is part of the \$81.5 million Canada-Newfoundland Agreement respecting the Economic Development Component of the Canadian Fisheries Adjustment and Restructuring Initiative, announced in August, 1999. The main thrust of the Fisheries Diversification Program is industry-wide research and development initiatives that reflect the economic development priorities of the Newfoundland and Labrador fishing industry.

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