Northwest Atlantic Fisheries Organization

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CANADIAN CONSERVATION MEASURES ON 3LNO YELLOWTAIL FLOUNDER AS AN APPLICATION OF THE PRECAUTIONARY APPROACH

Background/History of the Stock

The 3LNO yellowtail flounder stock is concentrated mainly on the southern Grand Bank and is recruited from the Southeast Shoal nursery ground in 3N both inside and outside 200 miles where the juvenile and adult components overlap in their distribution. The yellowtail fishery is usually managed together with the American plaice fishery - allowing a yellowtail fishery means bycatches of American plaice would be taken. Canada's share of the 3LNO yellowtail TAC is 97.5% - virtually all of which is caught inside the Canadian zone. The EU receives 2% of the TAC and 0.5% goes to the "Others" quota.

There was a moratorium on directed fishing of 3LNO yellowtail flounder from 1994 to 1997. Small catches were taken as bycatch in other fisheries. Catches decreased from around 2,000t in 1994 to about 280t in 1996 and increased to 800t in 1997. Prior to the moratorium, TACs had been exceeded each year from 1985 to 1993, however these catch statistics are uncertain, as 25-50% of the catch in some years was based on surveillance estimates and categorization of unspecified flounder catches. The fishery was reopened in 1998 with a TAC of 4,000t (with qualifications) and remained open for 1999 with a TAC of 6,000t (with qualifications). The 1998 catch was about 4350t with 3783t taken by Canada.

NAFO Scientific Council Advice

3LNO Yellowtail: The June 1997 report of the NAFO Scientific Council made the following observations:

- Stock size had increased since 1994; still lower than in the mid-1980s.
- Juveniles were concentrated in and around the nursery area located in the transboundary area of Division 3N.
- Recent year-classes below average – the 1992 and 1993 year classes are well above the long term average and age structure has remained stable.
- Stock is capable of sustaining a limited directed fishery but this will result in bycatch of American plaice and cod whose fisheries are under moratoria, as well as bycatches of juvenile yellowtail flounder in the nursery area.
- It noted that the bycatch concern should be taken into account in recommending TACs.

The June 1998 report of the Scientific Council recommended that a TAC for 1999 not exceed 6,000t, the directed fishery be confined to Divisions 3NO, and this fishery be carefully monitored.

.../2

The Scientific Council advised that based on the results of several surveys, there appears to have been a slow but steady increase in biomass in recent years, although it is still well below levels recorded in the early 1980s. The Council was also concerned with the limited geographical distribution of the yellowtail flounder stock, particularly with low densities in Division 3L. For these reasons as well as the above-noted bycatch concerns, it recommended using the lowest exploitation rate on record (6%) to establish a TAC (4,000t) for 1998 and using the same basis to establish a TAC (6,000t) for 1999 with a number of conditions. Because the stock in 3L is low, the Scientific Council also recommended that the fishery be confined to Division 3NO. This contraction of the stock area makes the stock more vulnerable to over-exploitation.

3LNO American plaice: This stock is of primary interest to Canada which has 98.5% of the TAC. The stock has been under moratorium since 1995. The June 1997 report of the Scientific Council made the following observations:

- Stock at a low level.
- No good year-classes since 1987.
- Total mortality remains high and the stock is composed of fish less than 6 years old.

Catches, which were around 45,000-50,000t from 1973-82, increased significantly by overfishing to 60,000t in the mid 1980s, then declined to 33,000t in 1990-91, 13,000t in 1992, and 900t in 1996. The spawning stock has declined precipitously since 1985. The Scientific Council noted that Russian and Canadian surveys showed a large decline in abundance and biomass since the late 1980s. The EU (Spain) survey in Division 3NO also showed a large decline in biomass from 1996 to 1997. Catches more than doubled since 1995 (to 1400t) despite the moratorium, primarily due to reported bycatches of plaice in the Greenland halibut fishery and the unregulated skate fishery in the NAFO Regulatory Area. There has also been a minimal amount of bycatch of plaice (199t) in the reopened 3NO yellowtail flounder fishery in 1998. Overall, the 1998 catch of yellowtail flounder was estimated at 3,783t.

Although once the largest flatfish fishery in the Northwest Atlantic, and in spite of being under a moratorium since 1995, surveys suggest that this stocks has reached a very low level and could still be in decline. The Council believed that a recovery of this stock is unlikely in the short term as high abundance of juveniles has not translated into a stronger fishable stock in the past, likely due to high by-catch levels in the Greenland halibut fishery.

.../3

Management Strategies/Measures for 3LNO Yellowtail Flounder

In June 1997 the Scientific Council recommended that the 3LNO yellowtail flounder stock could be re-opened in 1998 with a TAC of 4,000t but it also specified a number of management conditions for reopening the fishery which were consistent with the precautionary approach.

By this time Canada also had developed some experience in applying the precautionary approach with respect to criteria for reopening fisheries domestically. The application of the precautionary approach used consisted of:

- Basing the recommendation to reopen on the strength of biological indicators;
- Taking into account uncertainty about stock status;
- Opening only at a level which ensures continued rebuilding;
- Insisting on a solid assurance of management control.

Canada recognized that setting a TAC is only the first step in reopening a fishery. In all cases where a reopening was recommended, a number of management conditions have been specified. These conditions were imposed to ensure control of the fishery, protection of the stock against over-exploitation, and gathering of additional information about stock status. Management control took the form of a Conservation Harvesting Plan (CHP) which is developed by industry in consultation with the Department of Fisheries and Oceans (DFO). The concept of CHPs began in 1993 when certain groundfish fleets were required to implement them to ensure that juvenile fish were protected. The fisheries affected would only open to each fleet sector when acceptable plans had been approved for the respective sector by the Department. The concept has since been expanded to all groundfish fleet sectors. DFO ensures that the plans are particularly explicit and subject to close monitoring and strict enforcement. For fisheries that were to be re-opened, the CHPs included much more detailed and stringent controls/undertakings than for fisheries that were ongoing.

DFO ensures that Conservation Harvesting Plans include the following components:

- Matching the effort to the available resource;
- Seasonal catch quotas where appropriate;
- Extensive and timely monitoring through a combination of measures: log-books, observers at sea, dockside monitoring;
- Use of gear with appropriate selectivity to avoid catching juveniles and spread the catch over a range of year classes;
- By-catch provisions;
- Small fish protocols; and
- Suitable seasonal and area closures to protect juveniles, pre-spawning and spawning aggregations.

.../4

Therefore with this new experience with Conservation Harvesting Plans, Canada felt confident that a similar approach could be applied without jeopardy to the reopening of the 3LNO yellowtail flounder fishery. In 1998 Canada confirmed its intentions to NAFO to manage this stock under strict controls. These controls are outlined in Conservation Harvesting Plans applicable on an Atlantic-wide basis to all vessels > 100' (attached). Canada prosecuted the fishery in a very controlled manner as recommended by the Scientific Council with the following measures.

- The fishery is conducted in 3NO only – inside 200 miles to protect key juvenile fishing areas.
- A minimum mesh of 145mm diamond is mandatory in this fishery to minimize bycatches of juveniles
- Bycatches of American plaice, cod and witch flounder are kept at the lowest possible level through bycatch protocols (5% weekly of cod, 5% monthly of American plaice (reviewed on a weekly basis); designated areas will be closed for specified fleet sectors when bycatch limits are reached or exceeded; closures will be a minimum duration of 10 days; test fisheries may be conducted after 10 days with all costs borne by industry.
- The start of the fishery was delayed until August 1, 1998 to enable mature yellowtail to spawn one more time before the fishery reopened.
- Juveniles are protected through the implementation of a strict small fish protocol (30 cm for yellowtail and American plaice in all areas); designated areas may be closed for designated fleet sectors when the number of undersized fish reaches or exceeds 15% of the catch of the above species; closures will be a minimum duration of 10 days; test fisheries may be conducted after 10 days with all costs borne by industry.
- No discards allowed, all catch must be counted.
- In addition, vessels directing for 3LNO yellowtail flounder are subject to 100% observer coverage to monitor and sample catches in order to control the bycatch of American plaice and cod. A dockside monitoring program is also in place to monitor all landings.

Summary Results of the 1998 Fishery

- Fishery began in early August 1998
- Two Canadian companies participated in the fishery
- 9 different vessels participated in the fishery
- Total of 53 fishing trips
- Fishing activity ended on December 11, 1998
- Total catches:

Yellowtail	3,783t
American Plaice	199t (4.8%)
Cod	152t (3.7%)

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Management Objectives for the 3LNO yellowtail flounder stock

The following broad objectives for the 3LNO yellowtail flounder stock were discussed during the NAFO Joint Scientific Council/Fisheries Commission Working Group meeting in Spain in May 1999:

1. Maintain harvest levels that will continue to rebuild and maintain the stock biomass above the rebuilt biomass level.
2. Continue with a comprehensive suite of management measures.
3. Ensure conduct of the fishery in a manner that will not jeopardize recovery of other stocks in the area which are currently under moratorium, specifically 3NO cod and 3LNO American plaice.
4. Performance measures of interest to managers could be expressed in terms of biomass and its trajectory and where it is with respect to the reference level and catch levels. With respect to catch, the performance measure was: cumulative yield, yield trajectories and trends (in particular, to identify declining trends)
5. It was noted that production models do not permit determination of all reference points. It should be ensured that data are available for scientists to move towards using age-structured modelling.
6. Despite these limitations, production modelling is a tool that could be used to start to evaluate real F limits and could be used to provide insight in what will happen if there are lower or higher fishing mortality levels.
7. There is a need to develop "target" biomass levels in relation to the biological reference points so as to take into account management objectives including economic considerations.
8. Endorse the work of the Scientific Council in its attempts to develop a better understanding of the stock-recruit relationship.

July 1998

1998 CONSERVATION HARVESTING PLAN (CHP) ATLANTIC-WIDE FOR VESSELS > 100'

This Conservation Harvesting Plan (CHP) applies on an Atlantic-wide basis to all vessels greater than 100' (members of the Groundfish Enterprise Allocation Council), during 1998.

A licence condition for all > 100' vessels will authorize the licence holder to direct only for specified groundfish species. Directed fishing for any other species of groundfish will require a separate licence condition and harvesting plan.

Fishing Gear:

Gear restrictions will be:

1. Redfish in Units 2 & 3, 3O - minimum 90 mm mesh size, any trawl type year-round.
2. Redfish in 3M - minimum 130 mm mesh size, any trawl type year-round.
3. Flatfish in 3Ps, 3LNO - minimum 145 mm diamond.
4. Turbot in Sub-areas 0, 2, and 3 - minimum 145 mm diamond or 155 mm square mesh.
5. Cod, haddock, pollock in 4X,5 - minimum 130 mm square.
6. Pollock in 4VW- minimum 130 mm square or 155 mm diamond.
7. Flatfish in 4VWX+5 - minimum 155 mm square.
8. Skate in 3LNOPs - minimum 300 mm mesh in codend, 254 mm in remainder of trawl.
9. Unless otherwise specified, other species and areas which are currently open - minimum 155 mm diamond mesh or equivalent.
10. The square mesh that is currently authorized in 4VWX+5 is 130 mm or greater. The square mesh applies to the codend and the non tapering part of the lengthening piece. Other parts of the net cannot be less than 130 mm mesh.
11. Silver hake minimum 60 mm mesh and the use of a grate is required.
12. Gillnets are not authorized in 4VWX+5.
13. Minimum hook size of #14 circle for all areas and all species.

By-catch Provisions:

By-catch provisions will be:

14. 5% weekly with a 2% cap (reviewed as abundance increases) for each species that is closed, when fishing for redfish, flatfish in 4VW and skate in 3LNOPs;
15. 10% maximum by-catch of all groundfish combined when fishing for other groundfish species that can be fished with a mesh size <130 mm (redfish, silver hake);
16. 10% weekly by-catch of cod and haddock combined, with a 5% overall cap when fishing for pollock in 4VW when cod and haddock are closed;
17. when fishing for witch in 3Ps, 20% weekly by-catch of pollock and 10% weekly by-catch each of cod and haddock with 5% cap; the by-catch limititations on cod will be removed if the 3Ps cod fishery is opened;
18. 40% weekly by-catch on plaice in 3Ps with a 25% annual cap when fishing for witch;
19. 5% weekly by-catch for each of cod and haddock, 5% monthly (reviewed on a weekly basis) by-catch for American plaice, when fishing for yellowtail in 3NO; and
20. 10% weekly by-catch for any groundfish that is not under quota management.

Areas will be closed for specified fleet sectors when these limits are reached or exceeded.

By-catch of all quota species will be counted against enterprise allocations or competitive quotas.

Small Fish Protocol:

Based on the principle of letting most fish spawn at least once, the approach is to set a target, in any given year, that the harvest must consist of at least a specified percentage of the catch being sexually mature fish. Initially we should be moving towards a target of at least 50% being sexually mature. Fish will be considered undersized if smaller than:

21.	Cod, haddock and pollock:	43 cm in all areas; 45 cm for cod in 3Ps;
22.	Atlantic halibut:	81 cm in all areas;
23.	Redfish:	22 cm in all areas;
24	American plaice and yellowtail:	30 cm in all areas;
25.	Witch flounder:	33 in 4VWX; 30 cm in all other areas;
26.	Greenland halibut:	45 cm in sub-areas 0, 2, 3.[2]

27. Areas will be closed for specified fleet sectors when the number of undersized fish reaches or exceeds 15% of the catch of any of the above species.

[2] Subject to Ministeral decision on management measures for turbot in 1998.

There are four areas applicable for by-catch provisions and or small fish protocol when directing for yellowtail in 3NO. Each of these areas or quadrants will be monitored and provisions/protocols applied separately, and are defined by lines at 50:45 W longitude and 44:46 N Latitude.

Catch Monitoring and Test Fishing:

28. A Dockside Monitoring Program will be required.
29. For 1998, small fish and by-catch closures will be of a minimum duration of 10 days.
30. Test fisheries will be conducted after 10 days, all cost borne by industry.
31. Opening of any test area in 4VW for pollock or redfish will require a test fishery to determine the cod and haddock by-catch level and presence of small fish.
32. Once an area has been opened in 4VW, arrangements will be made to carry observes on a routine basis to ensure that bycatch or small fish is within acceptable levels.
33. Test area 1 in 4W will require observers at all times in 1998 when fishing with a mesh less than 130 mm and closure may be more than 30 days if consecutive tests reveal that the bycatch or small fish protocol is exceeded.
34. Directed test fishing for pollock in closed areas/seasons in 4VW and 5Z may be approved subject to conditions mutually acceptable to DFO and GEAC.

Seasons:

Open times are as follows:

35.	Redfish in Unit 2 - 3Ps,4VsWfgj:	January 1 to April 30, 1998 and July 1 to December 31, 1998
	- 3Pn/4Vn:	July 1 to October 31, 1998
36.	3Ps cod	June 29 to December 31, 1998
37.	All other species and areas -	January 1 to December 31, 1998

38. For 1998, in line with the NAFO Scientific Council recommendation, directed fishing for 3LNO yellowtail will open August 1, 1998.

The following seasonal closures will be in effect:

39. 4Vn and 4Vsb closed to all fishing [4]- January 1 to April 30, 1998.[3]
40. **4Vn closed for directed flatfish fishing[5]** - January 1 to December 31, 1998.[3]

[3] Subject to Minister's decision on 4TVn cod reopening.
[4] Test fishery for pollock will be permitted in 4Vsb during this period provided there is 100% observer coverage. Other details of the test fishery to be worked out between DFO and GEAC.
[5] Pending a DFO review of historical presence in this fishery by offshore vessels.

Spawning and Juvenile Closures:

41. Brown's Bank spawning closure - February 1 to June 15, 1998.
42 4VW juvenile area closed to all groundfish sectors for 1998 (subject to item 33).
43. Closed areas may be defined for the yellowtail fishery in 3NO to protect established nursery areas.
44. Use of mesh < 130 mm prohibited in 4X north of 43°30'N in the Bay of Fundy.
45. Use of mesh < 130 mm prohibited in any area where water is less than 50 fathoms in depth.
46. Use of mesh < 130 mm prohibited in the Browns Bank spawning area from January 1 to June 30.
47. Use of mesh < 130 mm prohibited in area defined by following coordinates.
    1. 43°20' 65°20'
    2. 43°05' 65°40'
    3. 42°40' 65°40'
    4. 43°05' 64°40'
    5. 43°20' 65°20'
48. A closed area may be defined (based on DFO/industry consultations) for redfish in 3O to avoid known habitat for juveniles.

Other Measures:

49. Mandatory release of all Atlantic halibut < 81 cm (32").
50. Directing for skate prohibited in 4VWX+5.
51. 3L closed to directed fishing for yellowtail in 1998.
52. Industry funded observer coverage at a rate of 5-10% decided jointly between DFO and GEAC on a stock by stock basis except for 3NO yellowtail where observer coverage will be 100%.
53. Pending a review of the shift in effort in 4X, fishing may be restricted to areas traditionally fished by offshore vessels prior to the moratorium in 1993 which may include limiting the catch of pollock to the areas traditionally fished .
54. **Divisional licence conditions will be required for vessels used under TVRP.**
55. Any vessel that carries dual mesh size (< 130 mm >) in 4VWX+5 will only be permitted to direct for the species that can be fished with the smaller mesh. Observers must be carried when a directed fishery for both small and large mesh species is requested.