

TABLE 1: AVAILABLE DATA**COMMON
NAME:**

ATLANTIC COD

SPECIES:*Gadus morhua***AREA:**

NORTHWEST ATLANTIC

STOCK:

NAFO DIV. 2J+3KL

CREATED BY:

JOANNE MORGAN

UPDATED BY:

JOANNE MORGAN 2002-03-19

Data status									
Year	Stock size	Stock composition	Age	Sex ratio	Maturity	Fecundity	Weight	Condition	Additional data
2001									
2000	(√)	(√)	(√)	(√)	(√)		(√)	(√)	
1999	(√)	√	√	√	√	(√)	√	√	√
1998	(√)	√	√	√	√	(√)	√	√	√
1997	(√)	√	√	√	√		√	√	√
1996	(√)	√	√	√	√		√	√	√
1995	(√)	√	√	√	√		√	√	√
1994	(√)	√	√	√	√	(√)	√	√	√
1993	(√)	√	√	√	√	(√)	√	√	
1992	√	√	√	√	√		√	√	
1991	√	√	√	√	√		√	√	
1990	√	√	√	√	√	(√)	√	√	
1989	√	√	√	√	√	(√)	√	√	
1988	√	√	√	√	√	(√)	√	√	
1987	√	√	√	√	√		√	√	
1986	√	√	√	√	√		√	√	
1985	√	√	√	√	√		√	√	
1984	√	√	√	√	√		√	√	
1983	√	√	√	√	√		√	√	
1982	√	√	√	√	√		√	√	
1981	√	√	√	√	√		√	√	
1980	√	√	√	√	√		√	√	
1979	√	√	√	√	√		√	√	
1978	√	√	√	√	√		√	√	

[illegible]

TABLE 2: DATA BASIS, FORMAT AND QUALITY

COMMON NAME:	ATLANTIC COD	
AREA:	NORTHWEST ATLANTIC	
STOCK:	NAFO DIVISIONS 2J3KL	
REPRODUCTIVE STRATEGY:	DETERMINATE BATCH SPAWNER	REF. NO.: 15,16
TIMING OF SPAWNING:	MARCH-JULY	REF. NO.: 6,7
OPTIMAL TIME FOR MATURITY SAMPLING:		REF. NO.:

Data basis, format and quality						
Variables	Year range	Data basis (A/L/W)	Data origin	Sampling frequency	Notes on data, methods and contents	Ref. No.
Stock size	1962-1970	A	CL	Q	VPA - last accepted model in 1993 survey offshore only prior to 1996 mark recapture commercial sentinel index inshore only	1
	1971-1977	A,L	CC,CL,S	Q,Q,Y		1,2,5
	1978-1992	A,L	CC,CL,S	Q,Q,B		1,2,14
	1993-1999	A,L	S	B		2
	2000	A,L	S	B		5
	1998-1999	L	CL			12
	1995-1999	A,L	CC			13
Stock composition	1962-1970	A	CL	Q		2
	1971-1977	A,L	CC,CL,S	Q,Q,Y		1,2,5
	1978-1992	A,L	CC,CL,S	Q,Q,B		2,5
	1993-1999	A,L	CC,CL,S	Q,Q,B		2,5
	2000	A,L	CC,CL,S	Q,Q,B		5
	1995-1999	A,L	CC			13
Age determination	1962-1970	A	CL	Q		2
	1971-1977	A	CC,CL,S	Q,Q,Y		1,2,5
	1978-1999	A	CC,CL,S	Q,Q,B		2,5
	2000	A	CC,CL,S	Q,Q,B		5
Sex ratio	1978-1999	A,L	S	Y		5,11
	2000	A,L	S	Y		5
Maturity:						
A. Ogives (E)	1962-1999	A	S	Y	By cohort annual	11
	1982-2000	A,L	S	Y		2,5
B. Skip of spawning						

Data basis, format and quality						
Variables	Year range	Data basis (A/L/W)	Data origin	Sampling frequency	Notes on data, methods and contents	Ref. No.
C. Spawning probability						
D. Other						
Fecundity:						
A. Estimation	1964	A,L	S	SPRING	Most samples from 3L only	3
	1967-1968	A,L	S,CL	FEB-MAY		4
	1988-90, 1993-94, 1998-99	A,L,W	S	APR-JUNE		5
B. First time vs. repeat spawners						
C. Atresia						
D. Other						
Weight:						
A. Commercial fisheries data	1962-1999	L	CL,CC	Q,Q	invariant length/weight relationship	2
	2000	L	CL,CC	Q,Q		5
B. Survey data	1978-1999	A,L,W	S	B	Many years only part of stock area	2,5,8
	2000	A,L,W	S	B		5
	1947-54, 1958, 1960-70, 1975	A,L,W	S	VARIOUS		5
C. Other						
Condition:						
A. Fulton	1978-1999	A,L,W	S	Y	many years only part of stock area	2,8
	2000	A,L,W	S	Y		5
	1947-54, 1958, 1960-70, 1975	A,L,W	S	various		5
B. HSI	1978-1999	A,L,W	S	Y		2,8
	2000	A,L,W	S	Y		5
C. Energy						
D. Other						
Egg viability:						
A. Egg quality						
B. Fertilisation success						
C. Egg mortality						
D. Other						
Larval viability:						
A. Hatching success						
B. Larvae quality						

Data basis, format and quality						
Variables	Year range	Data basis (A/L/W)	Data origin	Sampling frequency	Notes on data, methods and contents	Ref. No.
C. Mortality						
D. Other						
Spawning time	1946-1991	A,L	S	VARIOUS		6,7
Contamination						
Environmental key factors						
Other factors or parameters	1994-1999	L	S	Y	Pelagic O group survey	9

TABLE 3: STUDIES OF REPRODUCTIVE POTENTIAL**COMMON****NAME:**

ATLANTIC COD

AREA:

NORTHWEST ATLANTIC

STOCK:

NAFO DIVISIONS 2J3KL

Estimation of reproductive potential			
Subject	Brief description	Year range	Ref. No.
Potential or realised egg production			
Viable egg and larvae production			
Critical life stages			
Environmental influences	Effect of salinity	1959-1986	17
	Rejection of salinity effect	1959-1989	18
Stock recruitment relations	Exploration of relationship of sex ratio, weighted mean age of SSB, and proportion of first time spawners to residuals from Beverton-Holt stock recruit relationship	1962-1995	10
Other studies			

TABLE 4: DATA SOURCES

COMMON NAME:	ATLANTIC COD
AREA:	NORTHWEST ATLANTIC
STOCK:	NAFO Div. 2J+3KL

Data sources	(literature reference or contact person)
1.	BISHOP, C.A., E. F. MURPHY, M. B. DAVIS, J.W. BAIRD, and G. A. ROSE. MS 1993. An assessment of the cod stock in NAFO Divisions 2J+3KL. <i>NAFO SCR Doc.</i> , No. 86, 51 p.
2.	LILLY, G. R., P. A. SHELTON, J. BRATTEY, N. G. CADIGAN, E. F. MURPHY, and D. E. STANSBURY. MS 2000. An assessment of the cod stock in NAFO Divisions 2J+3KL. <i>Can. Stock Ass. Sec. Res. Doc.</i> , No. 63.
3.	MAY, A.W. 1967. Fecundity of Atlantic cod. <i>J. Fish. Res. Bd. Canada</i> , 24 : 1531-1551.
4.	PINHORN, A.T. 1984. Temporal and spatial variation in fecundity of Atlantic cod (<i>Gadus morhua</i>) in Newfoundland waters. <i>J. Northw. Atl. Fish. Sci.</i> , 5 : 161-170.
5.	UNPUBL. DATA: G.R. Lilly, DFO, P.O. Box 5667, St. John's, NF, A1C 5X1, Canada (lillyg@dfo-mpo.gc.ca).
6.	MYERS, R. A., G. MERTZ, and C.A. BISHOP. 1993. Cod spawning in relation to physical and biological cycles of the northern north-west Atlantic. <i>Fish. Oceanogr.</i> , 2 : 154-165.
7.	HUTCHINGS, J. A. and R. A. MYERS. 1993. Effect of age on the seasonality of maturation and spawning of Atlantic cod, <i>Gadus morhua</i> , in the northwest Atlantic. <i>Can. J. Fish. Aquat. Sci.</i> , 50 : 2468-2474.
8.	LILLY, G. R. MS 1998. Size-at-age and condition of cod in Divisions 2J+3KL during 1978-1997. <i>Can. Stock Ass. Sec. Res. Doc.</i> , No. 76.
9.	DALLEY, E. L., J. T. ANDERSON, and D. J. DAVIS. MS 2000. Year-class strength of northern cod (2J3KL) and southern Grand Bank cod (3NO) estimated from the pelagic juvenile fish survey in 1999. <i>Can. Stock Ass. Sec. Res. Doc.</i> , No. 96.
10.	MORGAN, M. J., P. A. SHELTON, D. P. STANSBURY, J. BRATTEY, and G. R. LILLY. MS 2000. An examination of the possible effect of spawning stock characteristics on recruitment in 4 Newfoundland groundfish stocks. <i>Can. Stock Ass. Sec. Res. Doc.</i> , No. 28.
11.	MORGAN, M. J. MS 2000. Estimating spawning stock biomass in 2J3KL cod using a cohort maturation model and variable sex ratio. <i>Can. Stock Ass. Sec. Res. Doc.</i> , No. 110.
12.	CADIGAN, N. and J. BRATTEY. MS 2000. Lower bounds on the exploitation of cod (<i>Gadus morhua</i>) in NAFO Subdivision 3Ps and Divs. 3KL in 1997-1999 from tagging experiments. <i>Can. Stock Ass. Sec. Res. Doc.</i> , No. 74.
13.	STANSBURY, D. E., D. MADDOCK PARSONS, and P.A. SHELTON. MS 2000. An age-disaggregated index from the sentinel program for cod in 2J3KL. <i>Can. Stock Ass. Sec. Res. Doc.</i> , No. 90.
14.	SHELTON, P. A., D. E. STANSBURY, E. F. MURPHY, G. R. LILLY, and J. BRATTEY. MS 1996. An assessment of the cod stock in NAFO Divisions 2J+3KL. <i>NAFO SCR Doc.</i> , No. 62.
15.	KJESBU, O.S. 1989. The spawning activity of cod, <i>Gadus morhua</i> L. <i>J. Fish. Biol.</i> , 34 : 195-206.
16.	KJESBU, O. S., P. R. WHITTHAMES, P. SOLEMDAL, and M. GREER WALKER. 1990. Ovulatory rhythm and a method to determine the stage of spawning in Atlantic cod (<i>Gadus morhua</i>). <i>Can. J. Fish. Aquat. Sci.</i> , 47 : 1185-1193.
17.	MYERS, R. A., K. F. DRINKWATER, N.J. BARROWMAN, and J.W. BAIRD. 1993. Salinity and recruitment of Atlantic cod (<i>Gadus morhua</i>) in the Newfoundland region. <i>Can. J. Fish. Aquat. Sci.</i> , 50 : 1599-1609.
18.	SHELTON, P. A. and D. B. ATKINSON. MS 1994. Failure of the Div. 2J3KL cod recruitment prediction using salinity. <i>DFO Atl. Fish. Res. Doc.</i> , No. 66.