NAFO Sci. Coun Studies, 37: 225–230

TABLE 1: AVAILABLE DATA

COMMON NAME: WITCH FLOUNDER

SPECIES: *Glyptocephalus cynoglossus*

AREA: NORTHWEST ATLANTIC

STOCK: GULF OF MAINE-GEORGES BANK (NAFO SUBAREAS 5+6)

CREATED BY: JAY BURNETT 2000-12-18

UPDATED BY:

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	(√)	√		(√)	√				(√)
1977	(√)	√		(√)	√				(√)
1976	(√)	√							(√)

Data status									
Year	**Stock size**	**Stock composition**	**Age**	**Sex ratio**	**Maturity**	**Fecundity**	**Weight**	**Condition**	**Additional data**
1975	(√)	√							(√)
1974	(√)	√							(√)
1973	(√)	√							(√)
1972	(√)	√							(√)
1971	(√)	√							(√)
1970	(√)	√							(√)
1969	(√)	√							(√)
1968	(√)	√							(√)
1967	(√)	√							(√)
1966	(√)	√							(√)
1965	(√)	√							(√)
1964	(√)	√							(√)
1963	(√)	√							(√)

TABLE 2: DATA BASIS, FORMAT AND QUALITY

COMMON NAME: WITCH FLOUNDER

AREA: NORTHWEST ATLANTIC

STOCK: GULF OF MAINE-GEORGES BANK (NAFO SUBAREAS 5+6)

REPRODUCTIVE STRATEGY: DETERMINATE SPAWNER **REF. NO.:**

TIMING OF SPAWNING: APRIL-AUGUST **REF. NO.:** 1

OPTIMAL TIME FOR MATURITY SAMPLING: MARCH-APRIL **REF. NO.:** 1

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	1963-1981	L	S	B	Relative abundance	2
	1982-1999	A	CL,S	Q	VPA	2
	2000	L	S	B	Relative abundance	3
Stock composition	1963-1979	L	S	B		2
	1980-1991	L,A	S,CL	Q		2
	1992-2000	L,A,W	S,CL,CC	Q	Low sampling of large market categories	2,3
Age determination	1980-2000		S,CL,CC	B,Q		2,4
Sex ratio	1980-2000	L,A	S	B		3
Maturity:						
A. Ogives (E)	1977-1979	L	S	B	Macroscopic observations	2,5,6
	1980-2000	L,A	S	B		
B. Skip of spawning						
C. Spawning probability						
D. Other						
Fecundity:						
A. Estimation	1983	L,A,W	CC	JUNE	Small sample n=25	5
B. First time vs. repeat spawners	1982-1993	A	S	B		7
C. Atresia						
D. Other						
Weight:						
A. Commercial fisheries data	1982-2000	L,A	CL	Q	Estimated using method of Rivard (1980)	2,3

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.**
B. Survey data	1963-1979	L,W	S	B	Estimated means	2,3
	1980-1982	L,A	S	B	Individual fish weights	8
	1983-1991	L,A	S	B	Estimated means	2,3
	1992-2000	L,A	S	B	Individual fish weights	2,3
C. Other						
Condition:						
A. Fulton						
B. HSI						
C. Energy						
D. Other	1980-1982	L,A,W	S	B	Gonadosomatic indices, n=>1100	8
Egg viability:						
A. Egg quality						
B. Fertilisation success						
C. Egg mortality						
D. Other						
Larval viability:						
A. Hatching success						
B. Larvae quality						
C. Mortality						
D. Other						
Spawning time	1963-2000		S	M-Q	Egg and larval surveys	1,9,10, 11
Contamination						
Environmental key factors						
Other factors or parameters						

TABLE 3: STUDIES OF REPRODUCTIVE POTENTIAL

COMMON NAME:	WITCH FLOUNDER
AREA:	NORTHWEST ATLANTIC
STOCK:	GULF OF MAINE-GEORGES BANK (NAFO SUBAREAS 5+6)

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			
Stock recruitment relations	Spawning stock biomass *vs* age 3 recruits Adjusted for first-time *vs* repeat spawners	1982-1994 1982-1993	2 7
Other studies			

TABLE 4: DATA SOURCES

COMMON NAME:	WITCH FLOUNDER
AREA:	NORTHWEST ATLANTIC
STOCK:	GULF OF MAINE-GEORGES BANK (NAFO SUBAREAS 5+6)

Data sources (literature reference or contact person)
1. SMITH, W. G. 1985. Temporal and spatial spawning patterns of the principal species of fish and invertebrates in the Georges Bank region. *NMFS Sandy Hook Lab. Rep.*, No. SHL 85-04, 35 p.
2. WIGLEY, S. E., J. K. T. BRODZIAK, and S. X. CADRIN. 1999. Assessment of the witch flounder stock in Subareas 5 and 6 for 1999. *NEFSC Ref. Doc.*, 99-16, 153 p.
3. S.E. WIGLEY, Northeast Fisheries Science Center, 166 Water St, Woods Hole, MA 02543, USA (Susan.Wigley@noaa.gov).
4. BURNETT, J. 1988. Witch flounder. *In*: Age determination methods for Northwest Atlantic species. J. Penttila, and L. M. Dery (eds.). *NOAA Tech. Rep., NMFS,* **72**: 135 p.
5. BURNETT, J., M. R. ROSS, and S. H. CLARK. 1992. Several biological aspects of the witch flounder (*Glyptocephalus cynoglossus* L.) in the Gulf of Maine-Georges Bank region. *J. Northw. Atl. Fish. Sci,*. **12**: 15-25.
6. O'BRIEN, L., J. BURNETT, and R. K. MAYO. 1993. Maturation of nineteen species of finfish off the northeast coast of the United States, 1985-1990. *NOAA Tech. Rep., NMFS,* **113**: 66 p.
7. WIGLEY, S. E. 1998. Effects of first-time spawners on stock-recruitment relationships for two groundfish species. *In*: Variations in maturation, growth, condition and spawning stock biomass production in groundfish. J. Morgan, J. Burnett, and E. Aro (eds.). *J. Northw. Atl. Fish. Sci.*, **25**: 215-218.
8. UNPUBL. DATA: J. BURNETT, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543, USA (Jay.Burnett@noaa.gov).
9. COLTON, J., and J. ST. ONGE. 1974. Distribution of fish eggs and larvae in continental shelf waters, Nova Scotia to Long Island. *Ser. Atlas Mar. Environ., Am. Geogr. Soc. Folio*, **23**.
10. COLTON, J. B., Jr., W. G. SMITH, A. W. KENDALL, Jr., P. L. BERRIEN, and M. P. FAHAY. 1979. Principal spawning areas and times of marine fishes, Cape Sable to Cape Hatteras. *Fish. Bull. U.S.*, **76**(4): 5.
11. SMITH, W.G., J. D. Sibunka, and A. WELLS. 1975. Seasonal distributions of larval flatfish (Pleuronectiformes) on the continental shelf between Cape Cod and Cape Lookout, N.C., 1965-66. *NOAA Tech. Rep., Spec. Sci. Rep. Fish*, **691**: 68 p.