

RED CRAB TABLES

Table D4.1 Annual red crab landings during 1982-2005 from dealer/weight reports.

YEAR	Landings, live wt., mt	Average price (\$/kg)	Total trips	Average landings (mt) per trip
1982	2,446	\$1.04	78	31.36
1983	3,253	\$0.96	101	32.21
1984	3,876	\$1.00	106	36.56
1985	2,237	\$0.97	66	33.90
1986	1,249	\$1.01	34	36.73
1987	2,111	\$1.23	71	29.73
1988	3,593	\$1.45	117	30.71
1989	2,394	\$1.25	63	37.99
1990	1,527	\$1.24	84	18.18
1991	1,791	\$1.11	52	34.45
1992	1,061	\$1.07	49	21.66
1993	1,440	\$1.07	73	19.73
1994	0	\$1.01	4	0.06
1995	572	\$1.25	83	6.89
1996	466	\$1.06	48	9.70
1997	1,726	\$1.08	104	16.59
1998	1,501	\$1.13	60	25.02
1999	1,870	\$1.10	67	27.90
2000	3,130	\$1.58	102	30.69
2001	4,004	\$2.02	147	27.23
2002	2,143	\$1.87	84	25.51
2003	1,920	\$2.15	70	27.43
2004	2,041	\$2.35	77	26.50
2005	2,014	\$2.39	63	31.96

Table D4.2 Annual landings (mt) by gear type from 1982-2005 based on dealer reports.

Year	Crab traps	Lobster traps	Trawls	Other	Total	Dealers	Vessels
1982	2,422	24			2,446		3
1983	3,231	22			3,253		5
1984	3,875	1			3,876		7
1985	2,237	0			2,237		7
1986	1,247	2			1,249		8
1987	2,107	3			2,111		14
1988	3,556	37	0		3,593		22
1989	2,390	3		0	2,394		10
1990	1,517	10	0		1,527		17
1991	1,789	2	0	0	1,791		11
1992	1,058	1	0	2	1,061		12
1993	1,432	1		7	1,440		12
1994		0	0		0		3
1995	50	520	2	0	572	6	14
1996	33	426	0	7	466	6	8
1997	1,084	641	0		1,726	7	11
1998	959	542			1,501	6	4
1999	1,526	343		0	1,870	5	6
2000	2,500	630		0	3,130	5	6
2001	3,969	24	9	0	4,004	6	12
2002	2,143	0		0	2,143	4	9
2003	1,717	62	112	30	1,920	3	5
2004	2,008			33	2,041	4	7
2005	2,014				2,014	2	4

Table D4.3 Annual reported landings and discards (mt) of red crab from 1994-2005 vessel trip reports (VTR) logbooks.

year	vessels reporting	trips	landings	discards	discards as a percent of landings
1994	8	12	1	5	500%
1995	16	84	283	153	54%
1996	20	83	637	493	77%
1997	15	77	591	330	56%
1998	13	80	198	84	42%
1999	10	93	421	0	0%
2000	11	163	344	64	19%
2001	18	150	1,753	301	17%
2002	10	80	1,521	93	6%
2003	9	62	1,412	99	7%
2004	10	104	1,733	764	44%
2005	11	77	1,642	600	37%

Table D4.4 Landings (mt) by year and survey stratum from vessel trip reports, 2003 and 2004.

Zone	2003	2004
A	277	516
B	26	54
C	724	654
D	364	326
Total	1,392	1,550

Table D4.5 Number of sea-sampled and port-sampled crabs, and proportion of catch assumed discarded by weight and numbers.

Year	Survey Stratum	N Crabs in Sea samples	N Crabs in Port Samples	Female Proportion Discard (weight)	Male Proportion Discard (weight)	Female Proportion Discard (numbers)	Male Proportion Discard (numbers)	Proportion Total Discard (weight)
2004	C	770	564	0.16	0.08	0.22	0.14	0.24
2004	D	645	227	0.06	0.05	0.11	0.09	0.12
2005	A	323	468	0.04	0.34	0.04	0.48	0.37
2005	C	456	593	0.51	0.04	0.64	0.06	0.55
2005	D	689	399	0.12	0.03	0.21	0.05	0.15
Mean	all	577	450	0.18	0.11	0.24	0.16	0.29

Table D5.1 Distribution of camera (a) and otter trawl (b) sampling effort in 1974, and in 2003-2005. Strata as defined by Wigley et al. (1975).

A. Camera Survey - Number of tows

1974 June						
Depth(fath)	Depth (m)	A	B	C	D	All
125-175	229-320	1		3	2	6
175-225	320-412	3		2	2	7
225-275	412-503	1	2	3	2	8
275-350	503-640	1	1	4	0	6
350-500	640-914	1		2		3
500-700	914-1280	1		1		2
700-900	1280-1646			1		1
2003 June						
Depth(fath)	Depth (m)	A	B	C	D	All
125-175	229-320	1	1	1	1	4
175-225	320-412			1		1
225-275	412-503	1	2	1		4
275-350	503-640		1		2	3
350-500	640-914	2	2	3	1	8
2003 August						
Depth(fath)	Depth (m)	A	B	C	D	All
125-175	229-320			1	1	2
175-225	320-412	1	1	1		3
225-275	412-503	2	2	1	1	6
275-350	503-640		1	2		3
350-500	640-914	4	2	1	2	9
2004 June						
Depth(fath)	Depth (m)	A	B	C	D	All
125-175	229-320	3	3	3		9
175-225	320-412	1		1	2	4
225-275	412-503	2	3	2	2	9
275-350	503-640	2			1	3
350-500	640-914	5	5	6	3	19
500-700	914-1280	3	3	3	2	11
2005 June						
Depth(fath)	Depth (m)	A	B	C	D	All
125-175	229-320	2	2	2	1	7
175-225	320-412	1	2			3
225-275	412-503		1	2		3
275-350	503-640	3	2	2	1	8
350-500	640-914	6	4	2	2	14
500-700	914-1280	3	3	2	1	9

B. Net Survey - Number of tows

1974 June						
Depth(fath)	Depth (m)	A	B	C	D	All
125-175	229-320	2	1	4	3	10
175-225	320-412	1	1	1	2	5
225-275	412-503	2	2	3	4	11
275-350	503-640		1	2	1	4
350-500	640-914	1	1	3	2	7
500-700	914-1280	1		2		3
700-900	1280-1646	1		2		3
2003 June						
Depth(fath)	Depth (m)	A	B	C	D	All
125-175	229-320	1		1	1	3
175-225	320-412		1			1
225-275	412-503	1	2	2		5
275-350	503-640		2	1	2	5
350-500	640-914	1		1		2
2003 August						
Depth(fath)	Depth (m)	A	B	C	D	All
125-175	229-320			1	1	2
175-225	320-412	1	1	2		4
225-275	412-503	2	1		1	4
275-350	503-640	1	2	1		4
350-500	640-914	3	2	2	2	9
2004 June						
Depth(fath)	Depth (m)	A	B	C	D	All
125-175	229-320	3	3	3	2	11
175-225	320-412			1	1	2
225-275	412-503	2	2	2	2	8
275-350	503-640	2	2	2	3	9
350-500	640-914	5	5	4	3	17
2005 June						
Depth(fath)	Depth (m)	A	B	C	D	All
125-175	229-320	2	1		1	4
175-225	320-412	1	2	2		5
225-275	412-503	3	1	2	2	8
275-350	503-640	1	3	2		6
350-500	640-914	4	4	4	2	14

Table D5.2 Specifications for sleds, cameras and nets used in the surveys conducted in 1974 and in 2003-2005.

		Wigley et al.	Wahle et al.
Sled	Length	2.7 m	2.1 m
	Width	2.1 m	1.2 m
	Height	1.9 m	1.5 m
	Material	6.4 cm steel tubing	10, 5, & 2.5 cm steel tubing
	Weight	1225 kg	363 kg
Camera System	Camera		
	Type	Film	Digital
	Manufacturer	Hydroproducts	Engage Technologies
	Make	DeepSea Photo Cam	SeaSnap
	Model	Model PC705	Nikon CoolPix 995, DigiSnap 2000
	Strobe		
	Manufacturer	Hydroproducts	Benthos
	Make	DeepSea Strobe	DeepSea Strobe
	Model	Model PF730	Model 382
	Medium	Kodak Ectachrome EF	Digital 2048x1536 pixel
Camera Setup	Height off bottom	1.7 m	0.92 m
	Angle of camera	16 deg	35 deg
	Shot interval	10 sec	15 sec.
	Tow Duration	30-75 min	30-45 min
	Approx. number photos	400	120-260
	Total area covered by photo	148 m ²	10 m ²
	Effective (illuminated) area sampled	31.8 m ²	6.6 m ²
Trawl Net	Type	semi-balloon otter trawl	semi-balloon otter trawl
	Length	4.9 m	6.2 m
	ground rope	5.8 m	7.3 m
	wire extension pieces	4 m	3.7 m
	mesh of wings	No. 9 thread, 3.8 cm stretched measure	No. 7 thread, 3.8 cm stretched measure
	mesh of body	No. 9 thread, 3.8 cm stretched measure	No. 7 thread, 3.8 cm stretched measure
	mesh of cod end	No. 15 thread, 3.2 cm stretched measure	No. 15 thread, 3.2 cm stretched measure
	codend liner	NA	12 mm
	tow speed	1.5 - 2 knots	1.5 - 2 knots
	tow duration	15 or 30 min	27 - 45 min

Table D5.3 Survey stratum areas in hectares (ha) by depth as calculated from Wigley et al. (1975).

Area by Depth (ha)					
Depth (fath)	A	B	C	D	All
125-175	30310	17803	55000	39109	142,222
175-225	43800	26996	75300	64100	210,196
225-275	23401	17200	37300	26501	104,402
275-350	44502	28301	62600	28901	164,304
350-500	65599	47827	63703	56836	213,491
500-700	121704	60442	77995	90025	350,166
700-900	124037	54679	67523	113028	359,266

Table D5.4. Non-targeted surveys: NEFSC groundfish bottom trawl surveys (winter, spring and fall), NEFSC shrimp survey (summer), NEFSC Cooperative Monkfish survey, and Rutgers Supplemental Finfish (transect) survey. Shown are the number of tows completed in survey strata A-D, as well as the Gulf of Maine.

	125- 175f 229- 320m	175- 225f 320- 412m	225- 275f 412- 503m	275- 350f 503- 640m	350- 500f 640- 914m	500- 700f 914- 1280m	700- 900f 1280- 1646m
STRATUM A							
NMFS Groundfish 00-05	43	25	4	3			
Monkfish 2001	4	2					
Monkfish 2004	34	2					
Transect January	5	5					
Transect March	12	9	2				
Transect May	3	4					
Transect November	3	3					
STRATUM B							
NMFS Groundfish 00-05	6						
Monkfish 2001	4	2	1				
Monkfish 2004	4	3					
Transect January	6	5					
Transect March	6	8	3				
Transect May	4	5					
STRATUM C							
NMFS Groundfish 00-05	21	3	2				
Monkfish 2001	2	9	5	3	3		
Monkfish 2004	23	9					
Transect March	1		1				
STRATUM D							
NMFS Groundfish 00-05	8	5	2	1			
Monkfish 2001		1					
Monkfish 2004		1					
GULF OF MAINE							
NMFS Groundfish 00-05	120	14					
NMFS Shrimp surveys	8						
Monkfish 2004	13						

Table D5.5 Average red crab catch per tow (kg) from the Rutgers supplemental finfish survey cruises, in chronological order from left to right, by survey stratum and depth zone.

SECTOR A								
	Mar 03	May 03	Jan 04	Mar 04	May 04	Nov 04	Jan 05	Mar 05
229-320m	0.6	7.8				1.5	9.0	15.9
320-412m	6.8	67.9	60.5	55.4	61.0	228.1	52.6	129.0
412-503m	52.0							249.1
SECTOR B								
	Mar 03	May 03	Jan 04	Mar 04	May 04	Nov 04	Jan 05	Mar 05
229-320m	.06			4.0	105	7.3	5.9	15.2
320-412m	29.0	33.8	14.3	18.5	116.9	293.6	19.8	127.5
412-503m	128.2	88.7	274.3	57.7	43.5	206.9	127.2	101.7

Table D7.1 Fishable biomass (mt) and average annual fishing mortality (y-1) estimates for deep-sea red crab by survey stratum (A, B, C and D) and for the entire stock during 2003-2005 based on camera/bottom trawl survey biomass estimates, total landings from dealer data, and landings by area from logbook data. Average fishing mortality was computed as the ratio of average landings and average biomass. Standard errors for recruited biomass were computed among the four surveys that occurred between 2003-2005 as in Tables 5.4-5.7.

Average 2003-2005 male recruited biomass from video/bottom trawl survey (mt).

Depth (fath)	A	B	C	D	All
125-175	410	24	0	0	434
175-225	4,319	166	908	1	5,395
225-275	766	469	1,475	1,175	3,885
275-350	2,449	447	3,469	9,559	15,924
350-500	1,441	629	3,512	5,033	10,616
All	9,384	1,735	9,364	15,769	36,253

Standard errors for average 2003-2005 male recruited biomass (not used in calculations).

Depth (fath)	A	B	C	D	All
125-175	299	19	0	0	245
175-225	3,261	2	128	0	2,715
225-275	271	135	328	105	968
275-350	0	83	1,635	3,052	2,542
350-500	362	140	695	1,855	1,564
All					5,459

Total landings from dealer data (mt, assumed 100% male).

Year	Landings
2003	1,920
2004	2,041
2005	2,014
Average 2003-2004	1,992

Original VTR landings by survey stratum mt, assume 100% male, only 2003-2004 available).

Year	A	B	C	D	Unknown
2003	277	26	724	364	529
2004	516	54	654	326	491

Percent by area from VTR landings.

Year	A	B	C	D	Unknown	All
2003	14%	1%	38%	19%	28%	100%
2004	25%	3%	32%	16%	24%	100%
Average 2003-2004	20%	2%	35%	17%	26%	100%

Percent to prorate landings by area.

	A	B	C	D	All
Average 2003-2004	27%	3%	47%	24%	100%

Prorated total landings from dealer data (mt assumed 100% male)

	A	B	C	D	All
Average 2003-2004	533	54	936	469	1,992

Fishing mortality = landings / fishable biomass.

	A	B	C	D	All
Average 2003-2004	0.057	0.031	0.100	0.030	0.055

Table D7.2 Fishable 1974 male biomass from the camera/bottom trawl survey (mt).

Depth (fathoms)	A	B	C	D	All
125-175	177	0	715	0	892
175-225	976	1,698	7,795	4,032	14,502
225-275	610	342	1,992	1,478	4,422
275-350	2,373	2,036	3,709	1,777	9,895
350-500	481	936	2,025	1,112	4,554
All	4,617	5,012	16,236	8,399	34,265