

SUPPLEMENTARY MATERIAL

Table S1. Number of pups counted on east-west transects and estimated pup production obtained from a visual survey of the southern Gulf of St. Lawrence on March 6, 2017.

Transect	Latitude	Start Longitude	End Longitude	Transect spacing (m)	Pups counted	Estimated Pups
1	46°34'	62°31.5'	62°58'	1,852	0	0
2	46°35'	62°58.5'	62°31.5'	1,852	6	185
3	46°36'	62°31'	62°59'	1,852	9	278
4	46°37'	62°56'	62°31'	1,852	14	432
5	46°38'	62°33'	62°57'	1,852	51	787
5	46°38'	62°33'	62°57'	926	51	394
6	46°38.5'	62°54.5'	62°33.5'	926	127	1,960
7	46°39'	62°32.5'	62°55'	926	204	2,148
8	46°39.5'	62°53.5'	62°33.5'	926	80	1,235
9	46°40'	62°34'	62°54.5'	926	104	1,605
10	46°40.5'	62°53.5'	62°27.5'	926	1	15
11	46°41'	62°41'	62°53'	926	165	2,547
12	46°40.5'	62°51'	62°27.5'	926	10	154
13	46°42'	62°27.5'	62°53.5'	926	4	31
13	46°42'	62°27.5'	62°53.5'	1,852	4	62
14	46°43'	62°50'	62°28'	1,852	12	370
15	46°44'	62°28'	62°51.4'	1,852	23	710
16	46°45'	62°50.5'	62°28'	1,852	75	2,315
17	46°46'	62°30.5'	62°50.5'	1,852	16	494
18	46°47'	62°49.5'	62°33'	1,852	8	247
19	46°48'	62°33.5'	62°50'	1,852	6	185
20	46°49'	62°52'	62°33.5'	1,852	2	62
-	-	-	-	-	Total estimated	17,216
-	-	-	-	-	SE	3.685

Table S2. Number of pups counted on east-west transects and estimated pup production obtained from a visual survey of the southern Gulf of St. Lawrence on March 7, 2017.

Transect	Latitude	Start Longitude	End Longitude	Transect spacing (m)	Pups counted	Estimated Pups
1	46°33'	62°13'	62°59.5'	1,852	4	123
2	46°34'	62°58.5'	62°8.5'	1,852	17	525
3	46°35'	62°58.5'	62°16'	1,852	28	432
3	46°35'	62°58.5'	62°16'	926	28	216
4	46°35.5'	62°9'	62°57'	926	175	2,701
5	46°36'	62°16'	63°2'	926	205	3,164
6	46°36.5'	62°57'	62°12.5'	926	219	3,380
7	46°37'	63°2'	62°16.5'	926	186	2,871
8	46°37.5'	62°12.5'	63°0.5'	926	88	1,358
9	46°38'	62°17'	63°2.5'	926	88	1,358
10	46°38.5'	63°0.5'	62°13.5'	926	108	1,667
11	46°39'	62°19.5'	62°47'	926	93	1,435
12	46°39.5'	62°53'	62°13.5'	926	2	31
13	46°40'	63°1.5'	62°19.5'	926	2	31
-	-	-	-	-	Total estimated	19,292
-	-	-	-	-	SE	2,201

Table S3. Number of pups counted on north-south transects and estimated pup production obtained from a photographic survey of the southern Gulf of St. Lawrence on March 7, 2017.

Line	Axial (Lon.)		Start Lat. (deg.)	End Lat. (deg.)	Spacing (m)	Length (m)	Photos	Cover (%)	Pups on Line	Estimated Seals
	Deg. (°)	Min.								
1	62	51.5	46.73	46.51	1,852	23,792	101	100	0	0.0
2	62	50.0	46.70	46.51	1,852	21,672	91	100	7	36.7
3	62	48.6	46.53	46.69	1,852	17,903	76	100	77	408.8
4	62	47.2	46.52	46.68	1,852	17,902	76	100	0	0.0
5	62	45.7	46.69	46.51	1,852	20,023	85	100	105	551.1
6	62	44.2	46.69	46.50	1,852	20,730	88	100	38	199.5
7	62	42.8	46.52	46.69	1,852	20,023	85	100	242	1,284.1
8	62	41.4	46.52	46.68	1,852	17,902	76	100	347	1,821.8
9	62	39.9	46.69	46.51	1,852	20,586	87	100	618	3,263.8
10	62	38.4	46.69	46.51	1,852	19,446	83	100	539	2,829.2
11	62	37.0	46.50	46.70	1,852	21,724	92	100	439	2,311.4
12	62	35.6	46.52	46.69	1,852	19,552	83	100	435	2,282.4
13	62	34.1	46.69	46.51	1,852	20,259	86	100	15	79.0
14	62	32.6	46.69	46.50	1,852	20,785	89	100	9	47.0
15	62	31.3	46.51	46.69	1,852	20,347	86	100	12	63.1
16	62	29.7	46.67	46.50	1,852	18,905	80	100	15	79.6
17	62	28.4	46.50	46.70	1,852	23,321	99	100	24	126.2
18	62	26.9	46.51	46.68	1,852	19,552	83	100	29	151.5
19	62	25.4	46.70	46.51	1,852	21,125	90	100	77	402.8
20	62	23.9	46.69	46.51	1,852	21,076	90	100	60	314.0
21	62	22.6	46.51	46.67	1,852	17,903	76	100	0	0.0
22	62	21.1	46.51	46.68	1,852	7,276	31	100	0	0.0
22	62	21.1	46.51	46.68	1,852	8,716	37	100	0	-
23	62	19.6	46.65	46.51	1,852	16,765	70	100	6	31.5
24	62	18.1	46.65	46.51	1,852	16,494	70	100	35	182.6
25	62	16.8	46.52	46.66	1,852	15,547	66	100	53	275.6
26	62	15.3	46.52	46.68	1,852	18,376	79	100	5	26.0
27	62	13.8	46.65	46.52	1,852	15,076	64	100	0	0.0
-	-	-	-	-	-	-			Total Estimate	16,768
-	-	-	-	-	-	-			SE	2,322

Table S4. Number of pups counted on east-west transects obtained during photographic surveys of the northern Gulf of St. Lawrence flown 17 March, 2017.

Line	Axial (Lat.)		Start Long. (deg.)	End Long. (deg.)	Spacing (m)	Length (m)	Photos	Cover (%)	Pups	Pups on Line	Estimated Seals
	Deg. (°)	Min.									
1	51	15.4	57.05	57.40	3,704	24,539	99	84	0	0.0	0.0
2	51	13.3	57.95	57.02	3,704	65,459	264	85	9	10.9	126.9
3	51	11.4	57.07	57.91	3,704	59,259	240	76	149	202.3	2,647.7
4	51	9.3	57.92	57.20	3,704	50,567	206	76	83	112.6	1,477.7
5	51	7.5	57.18	58.00	3,704	57,523	232	75	106	145.0	1,900.7
6	51	5.2	58.11	57.15	3,704	67,692	273	76	186	252.4	3,281.5
7	51	3.5	57.16	57.98	3,704	44,395	181	76	75	101.1	1,473.0
7	51	3.5	57.16	57.98	3,704	12,883	52	76	9	12.2	-
8	51	1.3	57.89	57.09	3,704	56,283	227	75	93	127.2	1,664.2
9	50	59.5	57.22	57.81	3,704	41,404	168	76	27	36.7	479.6
10	50	57.4	57.80	57.26	3,704	38,047	154	76	12	16.2	211.3
11	50	55.4	57.47	57.85	3,704	10,403	42	76	11	14.9	229.3
11	50	55.4	57.47	57.85	3,704	7,922	32	76	2	2.7	-
12	50	53.4	57.86	57.14	3,704	1,828	9	93	0	0.0	105.1
12	50	53.4	57.86	57.14	3,704	2,503	10	76	0	0.0	-
12	50	53.4	57.86	57.14	3,704	28,756	116	76	6	8.1	-
-	-	-	-	-	-	-	-	-	-	Total Estimate	13,597
-	-	-	-	-	-	-	-	-	-	SE	2,953

Table S5. Number of pups counted on east-west transects obtained during a visual survey of the northern Groais Island concentration flown March 14, 2017.

Transect	Lat.		Start Long.		End Long.		Heading	Transect (m)	Pups counted	Estimated seals
	Deg. (°)	Min.	Deg. (°)	Min.	Deg. (°)	Min.				
1	50	26	54	48.8	53	59.5	E	5,550	114	10,545
2	50	23	54	51.8	53	56.9	W	5,550	31	2,868
3	50	20	54	50.3	53	7.4	E	5,550	235	21,751
4	50	17	54	47.3	53	4.3	W	5,550	518	47,869
4	50	17	54	47.3	53	4.3	W	2,775	518	23,934
5	50	15.5	54	49.7	53	4.4	E	2,775	1,220	57,128
6	50	14	54	47.0	53	1.7	E	2,775	520	24,500
7	50	12.5	54	40.4	52	59.7	W	2,775	953	44,076
8	50	11	54	20.5	53	5.6	W	2,775	2,048	96,493
9	50	9.5	54	32.0	53	2.3	W	2,775	1,008	46,877
10	50	8	54	25.9	53	0.6	E	2,775	1,272	58,839
11	50	6.5	54	30.3	53	0.1	E	2,775	782	36,306
12	50	5.	54	26.8	53	0.8	W	2,775	211	9,736
12	50	5	54	26.8	53	0.8	W	5,550	211	19,471
13	50	2	54	26.8	54	1.0	E	5,550	307	28,398
14	49	59	54	35.9	54	24.9	E	5,550	18	1,665
15	49	56	54	36.2	54	26.3	W	5,550	248	22,940
16	49	53	54	45.3	54	31.9	E	5,550	12	1,110
-	-	-	-	-	-	-	-	-	Total Estimate	554,505
-	-	-	-	-	-	-	-	-	SE	5,219

Table S6. Number of pups counted on east-west transects obtained during a photographic survey of the northern Groais Island concentration flow March 14, 2017.

Line	Axial (Lat.)		Start Long. (deg.)	End Long. (deg.)	Spacing (m)	Length (m)	Photos	Cover (%)	Pups	Cor. Pups	Pups on Line	Estimated Seals
	Deg. (°)	Min.										
1	50	25	54.95	52.95	7,408	66,676	270	89	839	845.3	944.9	21,500.8
1	50	25	54.95	52.95	7,408	11,660	48	89	0	0.0	0.0	-
1	50	25	54.95	52.95	7,408	34,247	139	92	31	31.5	34.2	-
2	50	21	52.71	54.66	7,408	138,911	560	93	280	282.1	303.1	6,421.8
3	50	17	54.66	52.46	7,408	157,517	635	93	8,944	9,010.6	9,714.1	206,628.9
4	50	13	52.46	54.48	7,408	144,628	583	94	3,731	3,758.8	3,983.0	83,211.4
5	50	9	54.46	52.46	7,408	143,143	577	94	6,134	6,179.7	6,601.6	138,974.1
6	50	5	52.46	54.46	7,408	7,677	31	70	0	0.0	0.0	92,119.8
6	50	5	52.46	54.46	7,408	3,959	16	70	0	0.0	0.0	-
6	50	5	52.46	54.46	7,408	55,326	223	94	1,546	1,557.5	1,659.6	-
6	50	5	52.46	54.46	7,408	53,811	217	94	1,159	1,167.6	1,244.9	-
6	50	5	52.46	54.46	7,408	18,588	75	94	1,299	1,308.7	1,385.1	-
7	50	1	54.62	53.63	7,408	12,131	49	96	3	3.0	3.1	27,729.9
7	50	1	54.62	53.63	7,408	18,836	76	97	629	633.7	655.3	-
7	50	1	54.62	53.63	7,408	23,791	96	97	673	678.0	701.6	-
7	50	1	54.62	53.63	7,408	8,172	33	98	0	0.0	0.0	-
8	49	57	52.83	53.03	7,408	9,170	37	96	18	18.1	18.9	9,583.8
8	49	57	52.83	53.03	7,408	3,959	16	96	427	430.2	446.1	-
-	-	-	-	-	-	-	-	-	-	-	Total Estimate	586,170
-	-	-	-	-	-	-	-	-	-	-	SE	193,252

Table S7. Number of pups counted on east-west transects obtained during a photographic survey of the eastern Groais Island concentration flow March 14, 2017.

Transect	Axial (Lat.)		Start Long. (deg.)	End Long. (deg.)	Spacing (m)	Length (m)	Photos	Cover (%)	Pups	Cor. Pups	Pups on Line	Estimated Seals
	Deg. (°)	Min.										
7	50	1	52.86	53.13	7,408	19,342	78	96	1,696	1,708.6	1,784.78	36,790
8	49	57	53.04	53.30	7,408	19,095	77	97	145	146.08	151.10	3,062
8	49	57	53.88	54.00	7,408	8,421	34	97	0	0	0	-
8	49	57	54.19	54.56	7,408	27,005	109	98	507	510.77	519.20	10,521
9	49	53	54.19	54.56	7,408	27,000	0	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	Total Estimate	50,373
-	-	-	-	-	-	-	-	-	-	-	SE	22,477

Table S8. Number of pups counted on E-W transect during photographic survey of the Straits concentrations, March 18, 2017.

Transect	Axial (Lat.)		Start Long. (deg.)	End Long. (deg.)	Spacing (m)	Length (m)	Photos	Cover (%)	Pups	Cor. Pups	Pups on Line	Estimated Seals
	Deg. (°)	Min.										
1	51	11	54.64	55.46	7,408	57,523	232	97	2	2.2	2.2	45.7
2	51	7	55.46	54.66	7,408	56,527	228	97	6	6.5	6.7	135.9
3	51	3	54.64	55.45	7,408	57,021	230	98	87	94.5	96.3	1,946.2
4	51	1	55.44	54.66	7,408	55,534	224	96	106	115.2	119.9	1,236.3
4	51	1	55.44	54.66	3,704	55,534	224	96	106	115	120	618
5	50	59	55.41	54.68	3,704	52,063	210	98	690	750	764	7,715
6	50	57	54.59	55.44	3,704	59,511	240	96	401	436	454	4,677
7	50	55	54.11	55.46	3,704	95,216	384	98	800	869	883	8,858
8	50	53	55.45	54.22	3,704	86,791	350	97	1678	1823	1,881	19,179
9	50	51	55.44	54.18	3,704	89,267	360	98	1131	1229	1,254	12,626
10	50	49	53.94	55.40	3,704	103,150	416	98	90	98	100	1,006
11	50	47	53.94	55.38	3,704	101,911	411	96	108	117	122	626
11	50	47	53.94	55.38	7,408	101,911	411	96	108	117	122	1,253
12	50	43	55.50	53.96	7,408	109,351	438	92	125	136	148	3,145
13	50	39	55.53	54.11	7,408	100,673	407	90	189	205	229	5,044
14	50	35	53.77	54.95	7,408	83,585	344	99	387	420	424	8,584
15	50	31	54.99	53.72	7,408	90,256	363	97	414	450	463	9,363
16	50	27	53.82	54.87	7,408	75,185	306	98	361	392	398	8,043
17	50	23	54.90	53.50	7,408	100,327	404	97	50	54	56	1,130
18	50	19	53.47	53.59	7,408	8,373	35	99	0	0	0	0
18	50	19	53.62	54.90	7,408	91,955	375	98	94	102	104	2,123
19	50	15	54.88	53.33	7,408	110,597	446	96	179	194	202	4,129
-	-	-	-	-	-	-	-	-	-	-	Total Estimate	101,484
-	-	-	-	-	-	-	-	-	-	-	SE	15,630

Table S9. Number of pups counted on east-west transects obtained during a visual survey of the western edge of the Straits area flown March 18, 2017.

Transect	Lat.		Start Long		End Long		Heading	Transect (m)	Pups counted	Estimated seals
	Deg. (°)	Min.	Deg. (°)	Min.	Deg. (°)	Min.				
1	50	20.0	55	8.5	55	4.0	E	926	1	15
2	50	20.5	55	4.0	55	12.2	W	926	4	62
3	50	21.0	55	12.1	55	0.9	E	926	7	108
4	50	21.5	55	1.0	55	12.2	W	926	13	201
5	50	22.0	55	12.0	55	2.4	E	926	10	154
6	50	22.5	55	3.2	55	12.1	W	926	11	170
7	50	23.0	55	11.1	55	59.8	E	926	12	185
8	50	23.5	55	0.6	55	12.2	W	926	24	370
9	50	24.0	55	11.6	55	0.8	E	926	28	432
10	50	24.5	55	1.0	55	10.7	W	926	13	201
11	50	25.0	55	10.3	55	1.7	E	926	9	139
12	50	25.5	55	1.8	55	11.5	W	926	1	15
13	50	26.0	55	11.2	55	0.8	E	926	0	0
-	-	-	-	-	-	-	-	-	Total Estimate	2,053
-	-	-	-	-	-	-	-	-	SE	253

Table S10. Numbers of Harp Seal pups in individual age dependent stages in the Gulf of St. Lawrence and on the Front during March 2017.

Area	Date	Newborn	Thin White	Fat White	Grey	Ragged	Beater	Total
S. Gulf	March 07	242	764	416	-	0	0	1,422
S. Gulf	March 10	29	213	1,779	-	2	0	2,023
S. Gulf	March 12	3	90	1,617	-	24	0	1,734
Groais Is.	March 07	96	482	250	0	0	0	828
Groais Is.	March 10	26	1,628	1,040	118	6	0	2,818
Groais Is.	March 13	9	278	1,031	244	7	0	1,569
Groais Is.	March 16	0	79	1,961	678	18	0	2,736
Groais Is.	March 19	0	0	459	227	199	8	893
Groais Is.	March 24	0	0	195	190	515	260	1,160
Strait	March 08	97	111	0	0	0	0	208
Strait	March 10	0	27	0	0	0	0	27
Strait	March 13	4	144	154	30	1	0	333
Strait	March 16	1	9	89	28	0	0	127
Strait	March 17	13	121	1,204	464	5	0	1,807
Strait	March 18	0	35	162	85	1	0	283
Strait	March 20	0	1	303	239	3	0	546
Strait	March 22	0	2	341	255	3	-	601
Strait	March 24	0	0	199	429	11	0	639
Strait	March 25	0	0	15	32	18	2	67
Strait	March 26	0	0	60	227	171	62	520
N. Gulf	March 07	44	90	0	0	0	0	134
N. Gulf	March 10	13	158	18	0	0	0	189
N. Gulf	March 18	0	2	95	91	1	0	189
N. Gulf	March 24	0	0	33	50	17	0	100