

United States Department of the Interior



FISH AND WILDLIFE SERVICE

Division of Migratory Bird Management Branch of Assessment and Decision Support 11510 American Holly Drive Laurel, Maryland, 20708-4016

MEMORANDUM

TO: Mark Seamans

FROM: Joshua Dooley

DATE: 15 August 2024

SUBJECT: Atlantic Population Canada Goose Integrated Population Model 2025

Abundance Prediction

In fall 2020, the Atlantic Flyway Council adopted the use of an integrated population model (IPM) to inform harvest management decisions for Atlantic Population Canada geese (AP CAGO; Dooley 2019). The AP CAGO harvest strategy established regulatory thresholds relative to the IPM out-year prediction of breeding pairs (Table 1) and consideration of status and trends in productivity and total population size. The AP CAGO IPM predicted 2025 median number of breeding pairs was 133,500 (95% CI = 93,000–187,500; Figure 1, Table 3), indicating moderate hunting regulations for the 2025–26 hunting season.

Input data included in the AP CAGO IPM were provided in Table 2. Aerial surveys and banding operations were not conducted in 2020 and 2021 due to the COVID-19 pandemic. The IPM predicted adult harvest probability for the 2024–25 hunting season was 0.046 (95% CI = 0.037–0.058; Figure 1, Table 3). The IPM predicted August 2024 juvenile:adult age ratio was 1.53 (95% CI = 1.23–1.82), which was greater than the observed 1997–2023 average (1.28). Average temperature during May 2024 at Kuujjuaq, Québec was 3.7°C ($\bar{x}_{1997-2023}$ = 1.6°C), and the proportion of snow/ice cover on the Ungava Peninsula on 15 June 2024 was 0.29 ($\bar{x}_{1997-2023}$ = 0.39). In last year's memo, the out-year (2024) median breeding pair prediction from the IPM was 147,500 (95% CI = 105,000–199,000), which was +66% greater than the observed 2024 aerial survey breeding pair estimate of 88,890 ± 9,050 (SE; Lefebvre et al. 2024).

LITERATURE CITED

Dooley, J. L. 2019. Atlantic Population Canada Goose Integrated Population Model. Unpubl. Report to Atlantic Flyway Technical Section. U. S. Fish and Wildlife Service, Laurel, MD. November 2019.

Lefebvre, J., F. St-Pierre, and R. Spangler. 2024. A breeding pair survey of Canada Geese in northern Québec - 2024. Canadian Wildlife Service, Québec Region. Report to the Atlantic Flyway Technical Section. July 2024.

Table 1. Current prescribed Atlantic Population Canada goose harvest strategy showing population abundance thresholds and corresponding hunting regulations.

Abundance threshold		Regulations
(IPM out-year prediction of breeding pairs)	Package	(Days/Bag)
>160K	Liberal	Chesapeake (45/2), New England/Mid-Atlantic (45/3), NC (30/2), Canada (full season length/5)
Between 125-160K	Moderate	Chesapeake (30/2), New England/Mid-Atlantic (30/3), NC (30/1), Canada (25% decrease from liberal)
Between 60-125K	Restrictive	All U.S. AP harvest zones (30/1), Canada (50% decrease from liberal)
<60K and negative trend	Potential Closure	All areas (0/0)

Table 2. Input data included in the Atlantic Population Canada goose integrated population model and summarized band-recovery data, 1997–2024.

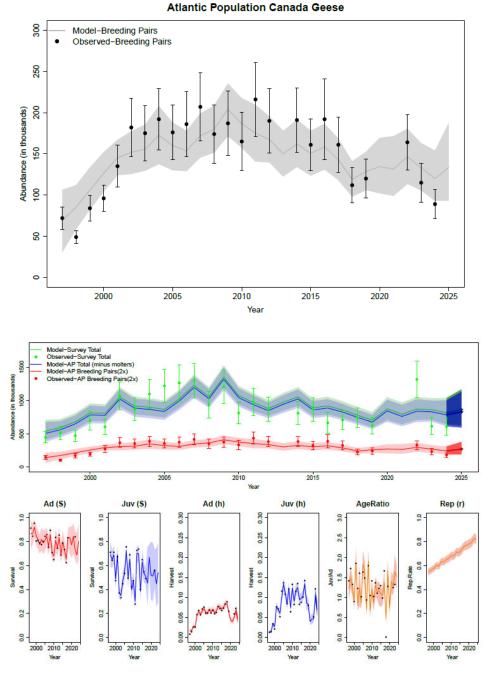
Survey abundance (in thousands)

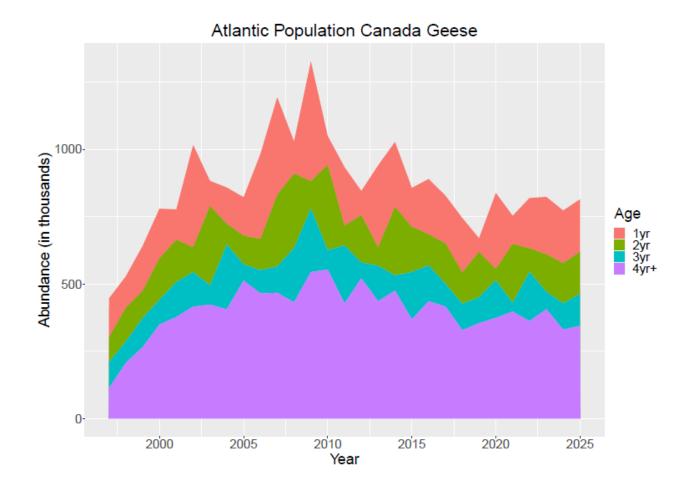
Harvest Regulations (days, bag)

		(III tilota	sanus)		D 1										
	Breeding Pairs Total			tal	Banding Env. Covariate				nes.	MidAt	Can	ada	Total		
	r Est SE Est SE			~-	age ratio										
Year					Juv:Ad		Prop. SnowIce	d	b	d	b	d	b	d	b
1997	72	7	444	44	1.42	1.5	0.25	0	0	0	0	0	0	0	0
1998	49	4	513	51	1.73	2.9	0.09	0	0	0	0	0	0	0	0
1999	84	8	468	45	1.33	2.8	0.61	6	1	15	1	20	3	41	5
2000	96	8	695	71	0.90	0.8	0.83	6	1	15	1	20	3	41	5
2001	135	13	602	60	1.86	4.8	0.07	30	1	30	2	30	5	90	8
2002	182	18	1,069	108	1.23	-1.1	0.65	45	1	45	2	45	5	135	8
2003	175	17	864	87	1.61	4.7	0.18	45	1	45	2	45	5	135	8
2004	192	19	1,096	112	1.02	-0.6	0.76	45	1.5	45	3	45	5	135	9.5
2005	176	17	1,219	126	1.64	4.7	0.08	45	2	45	3	45	5	135	10
2006	186	20	1,263	141	1.49	5.3	0.26	45	2	45	3	45	5	135	10
2007	207	21	1,297	132	0.94	-1.7	0.84	45	2	45	3	45	5	135	10
2008	174	18	934	104	1.80	5.5	0.09	45	2	45	3	45	5	135	10
2009	187	20	1,203	128	1.05	-1.9	0.90	45	2	45	3	45	5	135	10
2010	165	18	811	82	1.42	1.2	0.28	45	2	45	3	60	5	150	10
2011	216	23	980	104	1.03	-1.0	0.46	45	2	45	3	60	5	150	10
2012	190	20	871	93	1.37	1.9	0.10	50	2	50	3	60	5	160	10
2013	\vdash	_	_	\vdash	1.11	0.8	0.28	50	2	50	3	60	5	160	10
2014	191	20	808	87	1.23	1.7	0.13	50	2	50	3	60	5	160	10
2015	161	16	864	89	1.30	1.5	0.34	50	2	50	3	60	5	160	10
2016	192	25	663	80	0.99	0.9	0.45	50	2	50	3	60	5	160	10
2017	161	17	706	73	1.67	2.1	0.18	50	2	50	3	60	5	160	10
2018	112	11	739	77	0.01	-5.1	0.99	50	2	50	3	60	5	160	10
2019	120	12	622	64	1.28	4.3	0.18	30	1	30	2	60	5	120	8
2020	\vdash	_	_	_	_	-0.8	0.94	30	1	30	2	30	3	90	6
2021	_	_	_	_	-	3.4	0.42	30	1	30	1	30	3	90	5
2022	164	17	1,316	142	1.25	1.3	0.12	30	1	30	1	30	3	90	5
2023	115	12	612	65	1.33	2.4	0.11	45	2	45	3	30	3	120	8
2024	89	9	607	65	_	3.7	0.29	30	2	30	3	30	3	90	8

ADULT Year	Bandings	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1997	1299	6	6	14	15	28	29	16	19	17	14	7	6	8	5	1	2	0	2	0	3	1	0	0	0	0	0	0
1998	1981	0	17	21	25	44	47	18	33	36	11	14	9	11	14	8	6	3	1	3	0	1	0	0	0	0	0	0
1999	2987	o	0	43	45	97	65	60	48	40	38	18	27	19	11	8	5	6	2	5	4	2	0	1	1	0	0	0
2000	2312	0	0	0	34	69	63	42	39	37	24	19	16	21	13	9	5	4	3	2	3	0	2	0	0	0	0	0
2001	2706	0	0	0	0	79	83	72	61	56	37	24	28	22	15	18	10	15	4	3	4	3	1	1	0	1	0	1
2002	3098	0	0	0	0	0	137	98	80	67	49	35	30	33	22	12	19	18	14	3	4	6	1	1	0	0	0	0
2003	2064	0	0	0	0	0	0	71	73	57	42	32	40	23	21	13	11	9	9	5	8	2	3	2	1	1	1	0
2004	1119	0	0	0	0	0	0	0	55	43	25	20	26	16	26	7	7	2	8	2	5	3	0	1	0	0	0	0
2005	1127	0	0	0	0	0	0	0	0	61	34	30	28	23	18	6	12	8	6	6	5	4	4	0	0	0	1	1
2006	2911	0	0	0	0	0	0	0	0	0	121	83	92	59	52	32	25	31	23	24	16	8	8	6	2	3	3	2
2007	2106	0	0	0	0	0	0	0	0	0	0	97	64	56	43	23	20	18	19	17	14	13	4	6	3	1	2	1
2008	2187	0	0	0	0	0	0	0	0	0	0	0	116	59	71	24	45	31	26	13	14	19	7	5	3	1	1	2
2009	1412	0	0	0	0	0	0	0	0	0	0	0	0	63	39	27	25	21	18	13	7	7	4	7	3	2	2	5
2010	1824	0	0	0	0	0	0	0	0	0	0	0	0	0	98	34	32	44	42	22	23	13	6	5	7	6	2	2
2011	1018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	36	30	25	22	10	14	13	6	4	3	3	4
2012	1416	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	49	45	25	26	25	12	10	13	3	5	5
2013	1720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104	68	54	39	31	24	19	9	6	4	13
2014	1773	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	96	49	53	43	22	27	14	9	11	9
2015	1317	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	50	40	22	30	12	13	10	11
2016	1928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112	75	60	27	24	15	27	22
2017	1502	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	107	45	30	27	25	20	18
2018	3723	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	276	163	75	59	66	64
2019	1332	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	40	35	33	37
2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022 2023	1267 1306	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54 0	69 77
JUVENILE																												
Year	Bandings	4007	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
											2000					2011	2012	2010										
		1997								18	13	10				2	2	2	1							0		0
1997	1676	12	12	16	7	22	30	17	12	18	13	10	8	4	10	3	2	3	1	3	1	1	0	1	0	0	0	0
1997 1998	1676 3502	12 0	12 28	16 41	7 28	22 46	30 44	17 37	12 35	32	29	26	8 16	4 12	10 18	12	9	11	6	3	1 5	1 0	0	1 0	0	0	0	0
1997 1998 1999	1676 3502 4303	12 0 0	12 28 0	16 41 84	7 28 54	22 46 82	30 44 71	17 37 46	12 35 65	32 47	29 25	26 30	8 16 28	4 12 19	10 18 12	12 9	9	11 9	6 11	3 3 1	1 5 2	1 0 6	0 1 3	1 0 3	0 0 0	0	0 1 0	0
1997 1998 1999 2000	1676 3502 4303 2214	12 0 0 0	12 28 0 0	16 41 84 0	7 28 54 27	22 46 82 39	30 44 71 31	17 37 46 16	12 35 65 19	32 47 21	29 25 18	26 30 12	8 16 28 10	4 12 19 7	10 18 12 8	12 9 5	9 14 2	11 9 4	6 11 5	3 3 1 6	1 5 2 2	1 0 6 2	0 1 3 0	1 0 3 1	0 0 0	0 0	0 1 0 0	0
1997 1998 1999 2000 2001	1676 3502 4303 2214 5389	12 0 0	12 28 0	16 41 84	7 28 54 27 0	22 46 82 39 244	30 44 71 31 166	17 37 46 16 84	12 35 65 19 79	32 47 21 82	29 25 18 45	26 30 12 49	8 16 28 10 38	4 12 19 7 39	10 18 12 8 35	12 9 5 23	9 14 2 20	11 9	6 11	3 3 1	1 5 2	1 0 6	0 1 3	1 0 3	0 0 0	0 0 0	0 1 0	0 0 0
1997 1998 1999 2000 2001 2002	1676 3502 4303 2214 5389 4007	12 0 0 0 0	12 28 0 0	16 41 84 0	7 28 54 27 0	22 46 82 39 244 0	30 44 71 31 166 172	17 37 46 16 84 63	12 35 65 19 79 54	32 47 21 82 36	29 25 18 45 27	26 30 12	8 16 28 10 38 26	4 12 19 7 39 21	10 18 12 8 35 18	12 9 5 23 8	9 14 2 20 8	11 9 4 19 7	6 11 5 14 3	3 3 1 6 14 3	1 5 2 2 12	1 0 6 2 11	0 1 3 0 3	1 0 3 1 3	0 0 0 1 2	0 0	0 1 0 0 0	0 0 0 0
1997 1998 1999 2000 2001 2002 2003	1676 3502 4303 2214 5389 4007 6185	12 0 0 0 0 0	12 28 0 0 0 0	16 41 84 0 0	7 28 54 27 0 0	22 46 82 39 244 0	30 44 71 31 166 172 0	17 37 46 16 84 63 196	12 35 65 19 79 54 106	32 47 21 82 36 68	29 25 18 45 27 50	26 30 12 49 15 44	8 16 28 10 38 26 33	4 12 19 7 39 21 35	10 18 12 8 35 18 24	12 9 5 23 8 13	9 14 2 20 8 13	11 9 4 19	6 11 5 14	3 1 6 14	1 5 2 2 12 4	1 0 6 2 11 8	0 1 3 0 3 2	1 0 3 1 3 1 3	0 0 0 1 2	0 0 0 0	0 1 0 0 0 2	0 0 0 0 0
1997 1998 1999 2000 2001 2002	1676 3502 4303 2214 5389 4007	12 0 0 0 0 0	12 28 0 0 0	16 41 84 0 0 0	7 28 54 27 0	22 46 82 39 244 0	30 44 71 31 166 172	17 37 46 16 84 63	12 35 65 19 79 54	32 47 21 82 36	29 25 18 45 27	26 30 12 49 15	8 16 28 10 38 26	4 12 19 7 39 21	10 18 12 8 35 18	12 9 5 23 8	9 14 2 20 8	11 9 4 19 7	6 11 5 14 3 13	3 3 1 6 14 3	1 5 2 2 12 4 8	1 0 6 2 11 8 5	0 1 3 0 3 2 6	1 0 3 1 3	0 0 0 1 2 0	0 0 0 0 0	0 1 0 0 0	0 0 0 0
1997 1998 1999 2000 2001 2002 2003 2004	1676 3502 4303 2214 5389 4007 6185 2430	12 0 0 0 0 0 0	12 28 0 0 0 0 0	16 41 84 0 0 0 0	7 28 54 27 0 0 0	22 46 82 39 244 0 0	30 44 71 31 166 172 0	17 37 46 16 84 63 196	12 35 65 19 79 54 106 175	32 47 21 82 36 68 59	29 25 18 45 27 50 28	26 30 12 49 15 44 30 73	8 16 28 10 38 26 33 26	4 12 19 7 39 21 35 20	10 18 12 8 35 18 24	12 9 5 23 8 13 8	9 14 2 20 8 13 9	11 9 4 19 7 17 6	6 11 5 14 3 13 7	3 3 1 6 14 3 12 5	1 5 2 2 12 4 8	1 0 6 2 11 8 5	0 1 3 0 3 2 6 5	1 0 3 1 3 1 3	0 0 0 1 2 0 0	0 0 0 0 0 1 1	0 1 0 0 0 2 0	0 0 0 0 0
1997 1998 1999 2000 2001 2002 2003 2004 2005	1676 3502 4303 2214 5389 4007 6185 2430 3909	12 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0	16 41 84 0 0 0 0	7 28 54 27 0 0 0	22 46 82 39 244 0 0	30 44 71 31 166 172 0 0	17 37 46 16 84 63 196 0	12 35 65 19 79 54 106 175 0	32 47 21 82 36 68 59 338	29 25 18 45 27 50 28 103	26 30 12 49 15 44 30	8 16 28 10 38 26 33 26 54	4 12 19 7 39 21 35 20 37	10 18 12 8 35 18 24 15 41	12 9 5 23 8 13 8	9 14 2 20 8 13 9	11 9 4 19 7 17 6	6 11 5 14 3 13 7	3 1 6 14 3 12 5	1 5 2 2 12 4 8 9	1 0 6 2 11 8 5 5	0 1 3 0 3 2 6 5	1 0 3 1 3 1 3 4 6	0 0 0 1 2 0 0 2 1	0 0 0 0 0 1 1	0 1 0 0 0 2 0 0	0 0 0 0 0 1
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674	12 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0	7 28 54 27 0 0 0 0	22 46 82 39 244 0 0 0	30 44 71 31 166 172 0 0	17 37 46 16 84 63 196 0 0	12 35 65 19 79 54 106 175 0	32 47 21 82 36 68 59 338 0	29 25 18 45 27 50 28 103 324	26 30 12 49 15 44 30 73 197	8 16 28 10 38 26 33 26 54	4 12 19 7 39 21 35 20 37 82	10 18 12 8 35 18 24 15 41	12 9 5 23 8 13 8 26 42	9 14 2 20 8 13 9 22 38	11 9 4 19 7 17 6 15 29	6 11 5 14 3 13 7 11	3 3 1 6 14 3 12 5 8 22	1 5 2 2 12 4 8 9 7	1 0 6 2 11 8 5 5 13	0 1 3 0 3 2 6 5 6	1 0 3 1 3 1 3 4 6	0 0 0 1 2 0 0 2 1 2	0 0 0 0 0 1 1 1	0 1 0 0 0 2 0 0 0	0 0 0 0 0 1 0 1 2
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144	12 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0	22 46 82 39 244 0 0 0 0	30 44 71 31 166 172 0 0 0	17 37 46 16 84 63 196 0 0	12 35 65 19 79 54 106 175 0	32 47 21 82 36 68 59 338 0	29 25 18 45 27 50 28 103 324 0	26 30 12 49 15 44 30 73 197 118	8 16 28 10 38 26 33 26 54 111 66	4 12 19 7 39 21 35 20 37 82 33	10 18 12 8 35 18 24 15 41 72 23	12 9 5 23 8 13 8 26 42 13	9 14 2 20 8 13 9 22 38 10	11 9 4 19 7 17 6 15 29	6 11 5 14 3 13 7 11 18	3 3 1 6 14 3 12 5 8 22 8	1 5 2 2 12 4 8 9 7 12 8	1 0 6 2 11 8 5 5 13 14 13	0 1 3 0 3 2 6 5 6 12 6	1 0 3 1 3 1 3 4 6 18 5	0 0 0 1 2 0 0 2 1 2	0 0 0 0 0 1 1 1 1 2	0 1 0 0 0 2 0 0 0	0 0 0 0 0 1 0 1 2
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300	12 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0	22 46 82 39 244 0 0 0 0	30 44 71 31 166 172 0 0 0 0	17 37 46 16 84 63 196 0 0 0	12 35 65 19 79 54 106 175 0 0	32 47 21 82 36 68 59 338 0 0	29 25 18 45 27 50 28 103 324 0	26 30 12 49 15 44 30 73 197 118 0	8 16 28 10 38 26 33 26 54 111 66 346	4 12 19 7 39 21 35 20 37 82 33 183	10 18 12 8 35 18 24 15 41 72 23 79	12 9 5 23 8 13 8 26 42 13 44	9 14 2 20 8 13 9 22 38 10 37	11 9 4 19 7 17 6 15 29 13 40	6 11 5 14 3 13 7 11 18 11 36	3 3 1 6 14 3 12 5 8 22 8 18	1 5 2 2 12 4 8 9 7 12 8	1 0 6 2 11 8 5 5 13 14 13 18	0 1 3 0 3 2 6 5 6 12 6	1 0 3 1 3 1 3 4 6 18 5	0 0 0 1 2 0 0 2 1 2 0 8	0 0 0 0 0 1 1 1 1 2	0 1 0 0 0 2 0 0 0 2 0 0	0 0 0 0 0 1 0 1 2
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 1555	12 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0	32 47 21 82 36 68 59 338 0 0	29 25 18 45 27 50 28 103 324 0 0	26 30 12 49 15 44 30 73 197 118 0	8 16 28 10 38 26 33 26 54 111 66 346 0	4 12 19 7 39 21 35 20 37 82 33 183 67	10 18 12 8 35 18 24 15 41 72 23 79 32	12 9 5 23 8 13 8 26 42 13 44 22	9 14 2 20 8 13 9 22 38 10 37	11 9 4 19 7 17 6 15 29 13 40 15	6 11 5 14 3 13 7 11 18 11 36 15	3 3 1 6 14 3 12 5 8 22 8 18 5	1 5 2 2 12 4 8 9 7 12 8 18 5	1 0 6 2 11 8 5 5 13 14 13 18 5	0 1 3 0 3 2 6 5 6 12 6 12	1 0 3 1 3 1 3 4 6 18 5 8 3	0 0 0 1 2 0 0 2 1 2 0 8 3	0 0 0 0 0 1 1 1 1 2 4	0 1 0 0 0 2 0 0 0 2 0 4 3	0 0 0 0 0 1 0 1 2 1 2
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 1555 2774	12 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0	29 25 18 45 27 50 28 103 324 0 0	26 30 12 49 15 44 30 73 197 118 0 0	8 16 28 10 38 26 33 26 54 111 66 346 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0	10 18 12 8 35 18 24 15 41 72 23 79 32 251	12 9 5 23 8 13 8 26 42 13 44 22 82	9 14 2 20 8 13 9 22 38 10 37 11 46	11 9 4 19 7 17 6 15 29 13 40 15 46	6 11 5 14 3 13 7 11 18 11 36 15 30	3 3 1 6 14 3 12 5 8 22 8 18 5	1 5 2 2 12 4 8 9 7 12 8 18 5	1 0 6 2 11 8 5 5 13 14 13 18 5	0 1 3 0 3 2 6 5 6 12 6 12 1	1 0 3 1 3 1 3 4 6 18 5 8 3 9	0 0 1 2 0 0 2 1 2 0 8 3 3	0 0 0 0 0 1 1 1 1 2 4 1	0 1 0 0 0 2 0 0 0 0 2 0 0 4 3 1	0 0 0 0 0 1 0 1 2 1 2 0 7
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 1555 2774 1120	12 0 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0 0	29 25 18 45 27 50 28 103 324 0 0 0	26 30 12 49 15 44 30 73 197 118 0 0	8 16 28 10 38 26 33 26 54 111 66 346 0 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0	10 18 12 8 35 18 24 15 41 72 23 79 32 251 0	12 9 5 23 8 13 8 26 42 13 44 22 82 64	9 14 2 20 8 13 9 22 38 10 37 11 46 20	11 9 4 19 7 17 6 15 29 13 40 15 46 12	6 11 5 14 3 13 7 11 18 11 36 15 30 12	3 3 1 6 14 3 12 5 8 22 8 18 5 14 7	1 5 2 2 12 4 8 9 7 12 8 18 5	1 0 6 2 11 8 5 5 13 14 13 18 5 13	0 1 3 0 3 2 6 5 6 12 6 12 1 9	1 0 3 1 3 1 3 4 6 18 5 8 3 9	0 0 0 1 2 0 0 2 1 2 0 8 3 3	0 0 0 0 0 1 1 1 1 2 4 1 2	0 1 0 0 0 0 2 0 0 0 2 0 0 4 3 1	0 0 0 0 0 1 0 1 2 1 2 0 7
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 1555 2774 1120	12 0 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0 0	29 25 18 45 27 50 28 103 324 0 0 0 0	26 30 12 49 15 44 30 73 197 118 0 0 0	8 16 28 10 38 26 33 26 54 111 66 346 0 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0 0	10 18 12 8 35 18 24 15 41 72 23 79 32 251 0	12 9 5 23 8 13 8 26 42 13 44 22 82 64 0	9 14 2 20 8 13 9 22 38 10 37 11 46 20 173	11 9 4 19 7 17 6 15 29 13 40 15 46 12 97	6 11 5 14 3 13 7 11 18 11 36 15 30 12 61	3 3 1 6 14 3 12 5 8 22 8 18 5 14 7	1 5 2 2 12 4 8 9 7 12 8 18 5 17 4	1 0 6 2 11 8 5 5 13 14 13 18 5 13 4 38	0 1 3 0 3 2 6 5 6 12 6 12 1 9 1	1 0 3 1 3 1 3 4 6 18 5 8 3 9 1	0 0 1 2 0 0 2 1 2 0 8 3 3	0 0 0 0 0 1 1 1 1 2 4 1 2 1 5	0 1 0 0 0 2 0 0 0 2 0 4 3 1 1	0 0 0 0 0 1 0 1 2 1 2 0 7 0
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 1555 2774 1120 2134 2104	12 0 0 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0 0 0	29 25 18 45 27 50 28 103 324 0 0 0 0	26 30 12 49 15 44 30 73 197 118 0 0 0	8 16 28 10 38 26 33 26 54 111 66 346 0 0 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0 0	10 18 12 8 35 18 24 15 41 72 23 79 32 251 0 0	12 9 5 23 8 13 8 26 42 13 44 22 82 64 0	9 14 2 20 8 13 9 22 38 10 37 11 46 20 173 0	11 9 4 19 7 17 6 15 29 13 40 15 46 12 97 202	6 11 5 14 3 13 7 11 18 11 36 15 30 12 61 104	3 3 1 6 14 3 12 5 8 22 8 18 5 14 7 42 42	1 5 2 2 12 4 8 9 7 12 8 18 5 17 4 26 45	1 0 6 2 11 8 5 5 13 14 13 18 5 13 4 38 35	0 1 3 0 3 2 6 5 6 12 6 12 1 9 1 26 18	1 0 3 1 3 1 3 4 6 18 5 8 3 9 1 17 16	0 0 1 2 0 0 2 1 2 0 8 3 3 1 5	0 0 0 0 0 1 1 1 1 2 4 1 2 1 5	0 1 0 0 0 2 0 0 0 2 0 4 3 1 1 9 5	0 0 0 0 0 1 0 1 2 1 2 0 7 0 9
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2013	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 1555 2774 1120 2134 2104 2345	12 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0 0 0	29 25 18 45 27 50 28 103 324 0 0 0 0 0	26 30 12 49 15 44 30 73 197 118 0 0 0 0	8 16 28 10 38 26 33 26 54 111 66 346 0 0 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0 0	10 18 12 8 35 18 24 15 41 72 23 79 32 251 0 0	12 9 5 23 8 13 8 26 42 13 44 22 82 64 0	9 14 2 20 8 13 9 22 38 10 37 11 46 20 173 0	11 9 4 19 7 17 6 15 29 13 40 15 46 12 97 202 0	6 11 5 14 3 13 7 11 18 11 36 15 30 12 61 104 140	3 3 1 6 14 3 12 5 8 22 8 18 5 14 7 42 42 61	1 5 2 2 12 4 8 9 7 12 8 18 5 17 4 26 45 39	1 0 6 2 11 8 5 5 13 14 13 18 5 13 4 38 35 30	0 1 3 0 3 2 6 5 6 12 6 12 1 9 1 26 18 24	1 0 3 1 3 1 3 4 6 18 5 8 3 9 1 17 16 15	0 0 0 1 2 0 0 2 1 2 0 8 3 3 1 5 8	0 0 0 0 0 1 1 1 1 2 4 1 2 1 5 4 3	0 1 0 0 0 2 0 0 0 2 0 0 4 3 1 1 9 5 8	0 0 0 0 1 0 1 2 1 2 0 7 0 9
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 1555 2134 2104 2134 2104 2345 1852	12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0 0 0 0	29 25 18 45 27 50 28 103 324 0 0 0 0 0 0	26 30 12 49 15 44 30 73 197 118 0 0 0 0 0 0	8 16 28 10 38 26 33 26 54 111 66 346 0 0 0 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0 0 0	10 18 12 8 35 18 24 15 41 72 23 79 32 251 0 0 0	12 9 5 23 8 13 8 26 42 13 44 22 82 64 0 0	9 14 2 20 8 13 9 22 38 10 37 11 46 20 173 0	11 9 4 19 7 17 6 15 29 13 40 15 46 12 97 202 0	6 11 5 14 3 13 7 11 18 11 36 15 30 12 61 104 140 0	3 3 1 6 14 3 12 5 8 22 8 18 5 14 7 42 42 61 119	1 5 2 2 12 4 8 9 7 12 8 18 5 17 4 26 45 39 82	1 0 6 2 11 8 5 5 13 14 13 18 5 13 4 38 35 30 52	0 1 3 0 3 2 6 5 6 12 6 12 1 9 1 26 18 24	1 0 3 1 3 1 3 4 6 18 5 8 3 9 1 17 16 15 11	0 0 0 1 2 0 0 2 1 2 0 8 3 3 1 5 8 4 8	0 0 0 0 0 1 1 1 1 2 4 1 2 1 5 4 3 6	0 1 0 0 0 2 0 0 0 2 0 0 4 3 1 1 9 5 8	0 0 0 0 0 1 0 1 2 1 2 0 7 0 9 15 2
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 1555 2774 1120 2134 2104 2345 1852 2083	12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0 0 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0 0 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0 0 0 0 0	29 25 18 45 27 50 28 103 324 0 0 0 0 0 0 0	26 30 12 49 15 44 30 73 197 118 0 0 0 0 0 0	8 16 28 10 38 26 33 26 54 111 66 346 0 0 0 0 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0 0 0 0	10 18 12 8 35 18 24 15 41 72 23 79 32 251 0 0 0 0	12 9 5 23 8 13 8 26 42 13 44 22 82 64 0 0	9 14 2 20 8 13 9 22 38 10 37 11 46 20 173 0	11 9 4 19 7 17 6 15 29 13 40 15 46 12 97 202 0 0	6 11 5 14 3 13 7 11 18 11 36 15 30 12 61 104 140 0	3 3 1 6 14 3 12 5 8 22 8 18 5 14 7 42 42 61 119 0	1 5 2 2 12 4 8 9 7 12 8 18 5 17 4 26 45 39 82 156	1 0 6 2 11 8 5 5 13 14 13 18 5 13 4 38 35 30 52 76	0 1 3 0 3 2 6 5 6 12 6 12 1 9 1 26 18 24 42 55	1 0 3 1 3 1 3 4 6 18 5 8 3 9 1 17 16 15 11 23	0 0 1 2 0 0 2 1 2 0 8 3 3 1 5 8 4 8	0 0 0 0 0 1 1 1 1 2 4 1 2 1 5 4 3 6	0 1 0 0 0 2 0 0 0 2 0 4 3 1 1 9 5 8 8 10 11	0 0 0 0 0 1 1 2 1 2 0 7 0 9 15 2
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2015 2016 2017	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 1555 2774 2134 2104 2345 1852 2083 2628	12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0 0 0 0 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0 0 0 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0 0 0 0 0	29 25 18 45 27 50 28 103 324 0 0 0 0 0 0 0	26 30 12 49 15 44 30 73 197 118 0 0 0 0 0 0	8 16 28 10 38 26 33 26 54 111 66 346 0 0 0 0 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0 0 0 0 0	10 18 12 8 35 18 24 15 41 72 23 79 32 2551 0 0 0 0 0	12 9 5 23 8 13 8 26 42 13 44 22 82 64 0 0 0	9 14 2 20 8 13 9 22 38 10 37 11 46 20 173 0 0 0	11 9 4 19 7 17 6 15 29 13 40 15 46 12 97 202 0 0	6 11 5 14 3 13 7 11 18 11 36 15 30 12 61 104 140 0 0	3 3 1 6 14 3 12 5 8 22 8 18 5 14 7 42 42 61 119 0	1 5 2 2 12 4 8 9 7 12 8 18 5 17 4 26 45 39 82 156 0	1 0 6 2 11 8 5 5 13 14 13 18 5 13 4 38 35 30 5 276 281	0 1 3 0 3 2 6 5 6 12 6 12 1 9 1 26 18 24 42 55 113	1 0 3 1 3 1 3 4 6 18 5 8 3 9 1 17 16 15 11 23 5 6	0 0 1 2 0 0 2 1 2 0 8 3 3 1 5 8 4 8 23 32	0 0 0 0 0 1 1 1 1 2 4 1 2 1 5 4 3 6 10 11	0 1 0 0 0 0 0 0 0 0 0 2 0 0 0 2 0 0 4 3 1 1 1 9 5 8 8 8 8 1 9 1 9 1 8 8 1 1 1 1 1 1 1 1 1	0 0 0 0 0 1 1 2 1 2 0 7 0 9 15 2 15 9
1997 1998 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 2134 2104 2345 1852 2083 2628 10	12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30 44 71 31 166 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0 0 0 0 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0 0 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0 0 0 0 0	29 25 18 45 27 50 28 103 324 0 0 0 0 0 0 0	26 30 12 49 15 44 30 73 197 118 0 0 0 0 0 0	8 16 28 10 38 26 54 1111 66 346 0 0 0 0 0 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0 0 0 0 0 0	10 18 12 8 35 18 24 15 41 72 23 79 32 2251 0 0 0 0 0 0	12 9 5 23 8 13 8 26 42 13 44 22 82 64 0 0 0 0	9 14 2 20 8 13 9 22 38 10 37 11 46 20 173 0 0 0	11 9 4 19 7 17 6 15 29 13 40 15 46 12 97 202 0 0 0	6 11 5 14 3 13 7 11 18 11 36 15 30 12 61 104 140 0 0 0	3 3 1 6 14 3 12 5 8 22 8 8 22 8 18 7 42 42 42 61 119 0 0 0 0 0	1 5 2 2 12 4 8 9 7 12 8 18 5 17 4 26 45 39 82 156 0 0	1 0 6 2 11 8 5 5 13 14 13 18 5 5 13 4 38 35 30 5 22 7 6 6 6 6 7 6 7 6 7 6 7 6 7 6 7 6 7	0 1 3 0 3 2 6 5 6 12 6 12 1 9 1 26 18 24 42 55 113 0	1 0 3 1 3 4 6 18 5 8 8 3 9 1 17 16 15 11 12 13 14 16 15 16 16 16 17 16 17 16 17 17 16 16 17 17 17 17 17 17 17 17 17 17 17 17 17	0 0 0 1 2 0 0 0 2 1 2 0 8 8 3 3 1 5 8 8 4 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	0 0 0 0 0 1 1 1 1 2 4 1 2 1 5 4 3 6 10 11 0	0 1 0 0 0 0 2 0 0 0 2 0 0 4 3 1 1 1 9 5 8 8 8 8 1 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 0 0 0 1 1 2 1 2 0 7 0 7 0 9 15 2 15 9 9 15 9 9 15 9 9 15 9 9 15 9 15
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2010 2011 2012 2013 2014 2015 2016 2017 2018	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 2144 4300 1555 2774 1120 2134 2104 2345 1852 2083 2628 10	12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22 46 82 39 2444 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0 0 0 0 0 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0 0 0 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0 0 0 0 0 0 0	29 25 18 45 27 50 28 103 324 0 0 0 0 0 0 0 0	26 30 12 49 15 44 44 30 73 197 118 0 0 0 0 0 0 0	8 16 28 10 38 26 33 26 54 1111 66 346 0 0 0 0 0 0 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0 0 0 0 0 0	10 18 12 8 35 18 24 15 41 72 23 79 32 2551 0 0 0 0 0 0	12 9 5 23 8 13 8 26 42 13 44 22 82 64 0 0 0 0 0 0	9 14 2 20 8 13 9 22 38 10 37 11 46 20 173 0 0 0 0 0 0 0	111 9 4 119 7 117 6 15 29 13 40 15 146 12 97 202 0 0 0 0 0	6 11 5 14 3 13 7 11 18 11 36 15 30 12 61 104 140 0 0 0	3 3 1 6 14 3 12 5 8 22 8 18 5 14 7 42 42 61 119 0 0 0 0	1 5 2 2 12 4 8 9 7 12 8 18 5 17 4 26 45 39 82 156 0 0 0	1 0 6 2 111 8 5 5 5 13 14 13 18 5 13 4 38 35 30 5 22 76 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 3 0 3 2 6 5 6 12 6 12 1 9 1 26 18 24 42 5 5 5 0 0 0 0 0	1 0 3 1 3 1 3 4 6 6 18 5 8 3 9 1 17 16 15 11 23 15 10 10 10 10 10 10 10 10 10 10 10 10 10	0 0 0 1 2 0 0 2 1 2 0 8 3 3 1 5 8 4 8 2 3 0 0 0 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 1 1 1 1 2 4 4 1 2 1 5 4 3 6 10 10 10 10 10 10 10 10 10 10 10 10 10	0 1 0 0 0 2 0 0 0 2 0 0 4 3 1 1 1 9 5 8 8 10 11 11 18 18 18 18 18 18 18 18 18 18 18	0 0 0 0 1 0 1 2 1 2 0 7 7 0 9 15 2 15 9 9
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020	1676 3502 4303 2214 5389 4007 6185 2430 3909 4674 4300 2144 4300 2134 2142 2144 2145 2145 2146 2146 2146 2146 2146 2146 2146 2146	12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12 28 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 41 84 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 28 54 27 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22 46 82 39 244 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30 44 71 31 166 172 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	17 37 46 16 84 63 196 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12 35 65 19 79 54 106 175 0 0 0 0 0 0 0 0 0 0	32 47 21 82 36 68 59 338 0 0 0 0 0 0 0 0 0 0	29 25 18 45 27 50 28 103 324 0 0 0 0 0 0 0 0 0 0	26 30 12 49 15 44 30 73 197 118 0 0 0 0 0 0 0 0 0	8 16 28 10 38 26 33 26 54 111 66 346 0 0 0 0 0 0 0 0	4 12 19 7 39 21 35 20 37 82 33 183 67 0 0 0 0 0 0 0	10 18 12 8 35 18 24 15 41 72 23 79 32 2551 0 0 0 0 0 0	12 9 5 23 8 13 8 26 42 13 44 22 82 64 0 0 0 0 0 0	9 14 2 200 8 13 9 22 38 10 37 11 46 20 173 0 0 0 0 0 0 0 0 0 0 0	111 9 4 19 7 7 17 6 15 29 13 40 15 46 12 97 202 0 0 0 0 0 0	6 11 5 14 3 13 7 11 18 11 36 15 30 12 61 104 140 0 0 0 0	3 3 1 6 14 3 12 5 8 8 22 8 18 5 14 7 42 42 61 119 0 0 0 0 0	1 5 2 2 12 4 8 9 7 12 8 18 5 17 4 45 39 82 156 0 0 0	1 0 6 2 111 8 5 5 13 14 13 18 5 13 4 38 35 30 52 76 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 3 0 3 2 6 5 6 6 12 6 12 1 9 1 26 18 24 42 55 113 0 0 0 0	1 0 3 1 3 1 3 4 6 6 18 5 8 8 3 9 1 17 16 15 11 23 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 1 2 0 0 2 1 2 0 8 3 3 1 5 8 4 8 2 3 0 0 4 0 0 0 1 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 1 1 1 1 2 4 1 2 1 5 4 3 6 10 10 10 10 10 10 10 10 10 10 10 10 10	0 1 0 0 0 2 0 0 0 2 0 0 2 0 0 4 3 1 1 1 9 5 8 8 8 8 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 0 0 0 1 1 2 1 2 0 7 0 9 15 2 15 9 15 9

Figure 1 and Table 3. Atlantic Population Canada goose integrated population model posterior estimates (median/95% credible limits[line/shading]) of breeding pairs (top plot), total and breeding abundance indices (with 2025 out-year prediction in darker shading), other model parameters (middle plot; ad=adult; juv=juvenile; S=survival; h=harvest rate; AgeRatio=juvenile:adult at banding; r=reporting rate), and abundance indices by age class (bottom plot). Observed data (abundance, age ratios) and estimates of survival and harvest rates from other band-recovery analyses (i.e., fitting a global model in Program MARK) were included as points.





		Abundance						Sur	vival			На	Juv:Adult			
Year	į.	Breeding Pairs (2X)				Total		Adult		<u>Juvenile</u>		Adult		<u>Juvenile</u>	Age Ratio	
	median	95% CI	median	95% CI	median	95% CI	median	95% CI	median	95% CI	median	95% CI	median	95% CI	median	95% CI
1997	69,000	(30,500-106,500)	138,000	(61,000-213,000)	537,000	(411,000-705,000)	0.871	(0.749-0.974)	0.694	(0.593-0.799)	0.017	(0.013-0.022)	0.013	(0.010-0.018)	1.23	(0.99-1.45)
1998	85,500	(58,500-112,000)	171,000	(117,000-224,000)	590,000	(478,000-719,000)	0.866	(0.776-0.955)	0.649	(0.580 - 0.725)	0.017	(0.014-0.022)	0.015	(0.011-0.019)	1.51	(1.22-1.78)
1999	106,000	(82,500-133,500)	212,000	(165,000-267,000)	678,000	(567,000-807,000)	0.922	(0.842 - 0.984)	0.693	(0.624-0.767)	0.027	(0.024 - 0.032)	0.034	(0.028 - 0.040)	1.25	(1.06-1.51)
2000	126,500	(104,000-152,000)	253,000	(208,000-304,000)	813,000	(689,000-953,000)	0.849	(0.772 - 0.933)	0.487	(0.420-0.562)	0.027	(0.024-0.031)	0.027	(0.022-0.034)	0.92	(0.73-1.08)
2001	145,000	(124,000-167,000)	290,000	(248,000-334,000)	806,000	(688,000-940,000)	0.820	(0.742 - 0.899)	0.692	(0.631 - 0.756)	0.054	(0.049 - 0.060)	0.077	(0.069 - 0.087)	1.88	(1.63-2.23)
2002	152,000	(125,500-177,500)	304,000	(251,000-355,000)	1,051,000	(910,000-1,201,000)	0.776	(0.703 - 0.859)	0.374	(0.329 - 0.425)	0.065	(0.059 - 0.071)	0.070	(0.061 - 0.079)	0.82	(0.69-1.00)
2003	155,500	(129,500-185,500)	311,000	(259,000-371,000)	915,000	(791,000-1,052,000)	0.820	(0.726 - 0.914)	0.351	(0.312 - 0.397)	0.058	(0.053 - 0.065)	0.061	(0.053-0.069)	1.23	(0.78-1.77)
2004	172,500	(137,500-208,000)	345,000	(275,000-416,000)	897,000	(771,000-1,035,025)	0.791	(0.698 - 0.894)	0.473	(0.407 - 0.550)	0.066	(0.060 - 0.074)	0.100	(0.088 - 0.114)	0.87	(0.74-1.10)
2005	160,000	(130,000-188,000)	320,000	(260,000-376,000)	865,000	(745,000-997,000)	0.813	(0.724 - 0.898)	0.533	(0.478 - 0.595)	0.072	(0.065-0.081)	0.134	(0.120 - 0.148)	1.84	(1.59-2.15)
2006	153,500	(129,000-178,000)	307,000	(258,000-356,000)	1,023,000	(897,000-1,158,025)	0.846	(0.770 - 0.917)	0.727	(0.670 - 0.777)	0.063	(0.057-0.069)	0.111	(0.100-0.123)	1.64	(1.21-1.92)
2007	172,000	(145,500-199,000)	344,000	(291,000-398,000)	1,228,000	(1,072,000-1,386,000)	0.762	(0.695-0.842)	0.491	(0.424 - 0.567)	0.063	(0.057-0.069)	0.084	(0.072 - 0.097)	0.71	(0.56-0.84)
2008	180,000	(151,500-208,500)	360,000	(303,000-417,000)	1,057,000	(929,000-1,200,000)	0.860	(0.771 - 0.924)	0.655	(0.584 - 0.724)	0.070	(0.064 - 0.077)	0.124	(0.111-0.137)	1.92	(1.52-2.16)
2009	204,000	(171,500-235,500)	408,000	(343,000-471,000)	1,352,000	(1,191,000-1,526,000)	0.709	(0.649 - 0.789)	0.399	(0.332 - 0.478)	0.065	(0.059 - 0.072)	0.075	(0.063-0.088)	0.67	(0.52-0.78)
2010	186,500	(157,500-217,500)	373,000	(315,000-435,000)	1,075,000	(945,000-1,216,000)	0.680	(0.625-0.762)	0.475	(0.413-0.547)	0.071	(0.064 - 0.078)	0.124	(0.111-0.138)	1.21	(1.04-1.47)
2011	175,000	(140,500-209,500)	350,000	(281,000-419,000)	966,000	(843,000-1,107,000)	0.811	(0.716 - 0.902)	0.301	(0.252 - 0.360)	0.062	(0.055-0.069)	0.091	(0.078 - 0.107)	0.87	(0.67-1.01)
2012	167,500	(139,500-195,500)	335,000	(279,000-391,000)	878,000	(767,000-1,002,000)	0.752	(0.677 - 0.840)	0.704	(0.631-0.765)	0.067	(0.060 - 0.074)	0.117	(0.103-0.132)	1.32	(1.02-1.51)
2013	150,000	(122,500-178,000)	300,000	(245,000-356,000)	973,000	(847,000-1,111,000)	0.837	(0.754 - 0.907)	0.700	(0.624-0.760)	0.078	(0.071 - 0.086)	0.126	(0.111-0.141)	1.15	(0.97-1.38)
2014	162,000	(134,000-191,500)	324,000	(268,000-383,000)	1,053,000	(922,000-1,198,000)	0.692	(0.631 - 0.776)	0.385	(0.328-0.452)	0.076	(0.069 - 0.084)	0.095	(0.083-0.108)	1.18	(0.81-1.40)
2015	150,500	(123,500-178,000)	301,000	(247,000-356,000)	888,000	(769,000-1,024,000)	0.800	(0.708 - 0.888)	0.632	(0.546 - 0.725)	0.072	(0.064 - 0.079)	0.098	(0.085-0.112)	1.10	(0.77-1.28)
2016	158,500	(131,000-186,500)	317,000	(262,000-373,000)	916,000	(791,000-1,054,000)	0.730	(0.657-0.817)	0.537	(0.460-0.621)	0.075	(0.068-0.083)	0.104	(0.091 - 0.118)	1.06	(0.82-1.22)
2017	143,000	(118,000-168,500)	286,000	(236,000-337,000)	856,000	(738,000-986,000)	0.654	(0.607 - 0.722)	0.510	(0.447-0.581)	0.084	(0.076 - 0.093)	0.135	(0.121-0.150)	1.38	(1.19-1.67)
2018	119,000	(98,000-141,000)	238,000	(196,000-282,000)	776,000	(669,000-901,000)	0.834	(0.745 - 0.905)	0.454	(0.273 - 0.756)	0.085	(0.078 - 0.093)	0.086	(0.068-0.110)	0.47	(0.38-0.57)
2019	128,500	(106,000-152,500)	257,000	(212,000-305,000)	703,000	(597,000-824,000)	0.835	(0.698 - 0.929)	0.670	(0.538-0.776)	0.063	(0.057 - 0.071)	0.083	(0.071 - 0.096)	1.67	(1.35-1.92)
2020	134,500	(102,000-169,500)	269,000	(204,000-339,000)	873,000	(707,000-1,047,000)	0.774	(0.668-0.924)	0.520	(0.311-0.798)	0.043	(0.038 - 0.051)	0.040	(0.032-0.051)	0.75	(0.60-0.90)
2021	131,500	(99,000-171,500)	263,000	(198,000-343,000)	791,000	(643,000-970,000)	0.844	(0.701 - 0.951)	0.513	(0.308 - 0.794)	0.040	(0.034 - 0.047)	0.046	(0.035-0.060)	1.40	(1.12-1.65)
2022	146,500	(113,488-180,512)	293,000	(226,975-361,025)	869,000	(709,000-1,051,000)	0.740	(0.652 - 0.886)	0.567	(0.426 - 0.738)	0.049	(0.042 - 0.057)	0.046	(0.037 - 0.057)	1.28	(1.07-1.55)
2023	133,000	(105,500-163,000)	266,000	(211,000-326,000)	859,000	(710,000-1,032,000)	0.690	(0.613 - 0.872)	0.448	(0.261 - 0.742)	0.068	(0.059 - 0.078)	0.105	(0.092 - 0.120)	1.64	(1.37-2.05)
2024	120,000	(93,000-154,000)	240,000	(186,000-308,000)	814,000	(640,000-1,037,000)	0.802	(0.649-0.955)	0.541	(0.295-0.786)	0.046	(0.037-0.058)	0.070	(0.054-0.089)	1.53	(1.23-1.82)
2025	133,500	(93,000-187,500)	267,000	(186,000-375,000)	859,000	(622,000-1,166,000)										