

2022 Nebraska Light Goose Conservation Order Activities



**by
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May 2022**

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EXECUTIVE SUMMARY

Nebraska Game and Parks Commission (NGPC) conducted a Light Goose Conservation Order (LGCO) from 10 February-15 April 2022. The LGCO allowed the use of special measures (i.e., electronic calls and unplugged shotguns), an extension of shooting hours to 30 minutes past sunset, and no bag or possession limits for the harvest of light geese (snow, blue, and Ross's geese). We obtained the names and addresses of potential LGCO participants from the summer 2021-spring 2022 Harvest Information Program (HIP). Online surveys were emailed to 22,382 HIP registrants to estimate LGCO participation, effort, hunting methods, and harvest of light geese. There were 776 bad email addresses. Of the 3,098 survey respondents (14% response rate), 520 individuals reported that they hunted light geese in spring 2022 (17% participation rate). Residents and non-residents participated in the LGCO at similar rates. We stratified survey respondents into four groups by anticipated participation and experience. We assigned 135 hunters who registered for HIP on or after 10 February to the SPRING group. Of the hunters that registered for HIP before 10 February, 287 indicated that they hunted light geese the previous season (SNOW group), 1,384 had only hunted ducks or dark geese the previous season (DUCK group), and 1,292 reported that they had not hunted waterfowl the previous season (OTHER group). We extrapolated survey results across all HIP registrants and estimated that 4,109 hunters spent a total of 22,345 days afield and harvested 91,647 light geese. Harvest in 2022 was up 42% from the harvest in 2021; hunter participation and number of hunt days also increased. Hunters shot and failed to recover approximately 4,820 light geese during the 2022 LGCO, a significant increase from the estimated 2,620 light geese not recovered in 2021. Harvest in 2022 was greatest in the East Zone (49%), followed by the West Zone (40%) and Rainwater Basin Zone (11%). Approximately 71% of LGCO participants used decoys, 18% used sneak or jump shooting tactics, and 9% used pass shooting or other methods of harvest. Dry conditions in spring 2022 provided hunters excellent road and field access, and a steady migration through the state appear to have allowed hunters to be more successful this year compared to previous years.

INTRODUCTION

Light goose populations have exploded in recent decades, detrimentally affecting the arctic tundra where they breed. The U.S. Fish and Wildlife Service (USFWS) allows states to implement Light Goose Conservation Orders (LGCO) to increase harvest and attempt to return light goose populations to sustainable levels. Nebraska Game and Parks Commission (NGPC) conducted a LGCO from 10 February to 15 April 2022. During the LGCO, participants could use expanded hunting measures (electronic calls and unplugged shotguns), there was a 30-minute extension of shooting hours, and harvest was not restricted by bag or possession limits. Nebraska had three light goose harvest zones in 2022—Rainwater Basin (RWB), East, and West zones (Figure 1). The LGCO opened on 10 February across the state and remained open until 5 April in the RWB and West zones and 15 April in the East zone. Hunting light geese was illegal on the Ducks Unlimited Verona Wetland Complex and most USFWS Waterfowl Production Areas (WPA) in Nebraska, with the notable exceptions of Harvard and Cottonwood WPAs. It was also illegal to hunt light geese within Platte River buffers that varied in width by hunting zone, location, and date. All state-managed Wildlife Management Areas remained open to LGCO activities.

Nebraska continued to experience below-average precipitation and above-average temperatures during summer and autumn 2021 that resulted in drier habitat conditions than 2020. Considerably dry conditions continued into spring 2022 (Table 1). To mitigate the dry conditions, NGPC and USFWS pumped water into 18 wetlands in the Rainwater Basin. Overall, less wetland habitat was available to spring-migrating light geese in 2022 than most years.

Peak spring migration in 2022 was similar to 2021 and 2020, likely because of above-average temperatures in late January and February (Table 1). Light geese began arriving around 15 February and light goose abundance in the state continued building until early March. Dry conditions kept light geese from dispersing widely across the landscape, while dry fields and roads offered abundant access to geese during the 2022 LGCO.

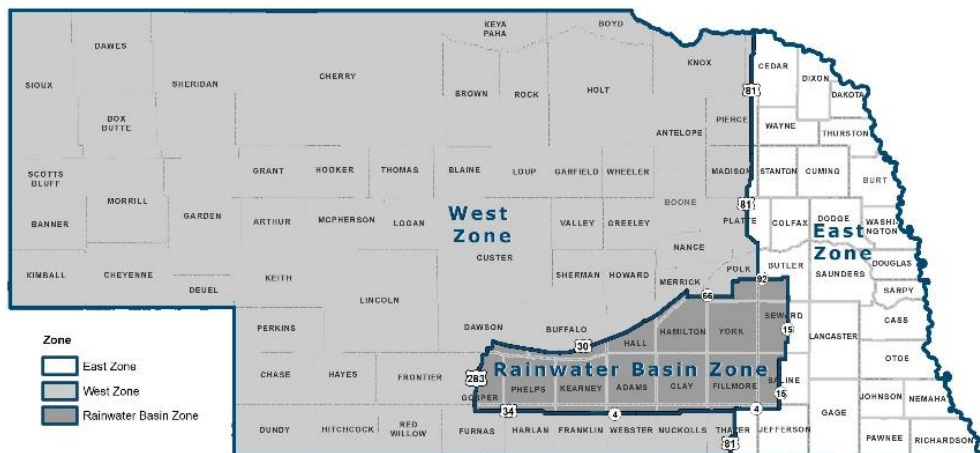


Figure 1. Nebraska light goose harvest zones during the 2022 Light Goose Conservation Order.

Table 1. Hydrology and migration chronology of light geese during the Light Goose Conservation Order in Nebraska, 2000-2022.

Year	Hydrology ¹	Light Goose Arrival	Light Goose Departure	Peak Migration
2000	5	7 February	20 March	24 February
2001	10	7 March	22 March	14 March
2002	4	14 February	22 March	15 March ²
2003	2	7 March	21 March	14 March
2004	5	22 February	8 March	1 March
2005	3	4 February	8 March	27 February
2006	2	1 February ³	8 March	1 March
2007	7.5	21 February	11 March	7 March
2008	5	24 February	16 March	7 March
2009	7.5	7 February	21 March	6 March
2010	8	1 March	14 March	7 March
2011	3	16 February	18 March	10 March ²
2012	3	17 February	5 March	25 February
2013	1	5 February	19 March	1 March
2014	3	26 February	14 March	11 March
2015	5	6 March	20 March	13 March
2016	6	17 February	27 March	23 February
2017	2	5 February	20 February	7 March
2018	4	21 February	9 March	1 March
2019	10	12 March	20 March	15 March
2020	8	15 February	12 March	5 March
2021	3	24 February	14 March	7 March
2022	1	15 February	15 March	7 March

¹Hydrology on scale of 1-10, with 1 being the driest and 10 being the wettest conditions.

²In 2002 and 2011, there were two peaks of migration due to major cold front and snow. First peaks of migration were approximately 20 February in both years.

³Light geese began arriving into Nebraska during January, prior to initiation of Light Goose Conservation Action.

METHODS

Nebraska Game and Parks Commission issued an electronic survey to migratory bird hunters to estimate total participation, effort, and harvest success in Nebraska during the LGCO. Harvest Information Program (HIP) registrants from the current season were potential survey recipients. We stratified survey recipients into resident or non-resident hunters, then into SPRING, SNOW, DUCK, or OTHER groups. SPRING hunters were those who registered for HIP on or after 10 February; we expected they would have the highest participation rates, as those HIP registrations would only be valid for the 2022 LGCO. The SNOW group was comprised of hunters who registered for HIP before 10 February and indicated they had previously pursued light geese. The DUCK group was waterfowl hunters that indicated they had only hunted dark geese or ducks the previous season. Finally, the OTHER group included anybody that had not hunted waterfowl during the previous season (e.g., dove or new hunters). We assumed that SNOW hunters would participate less than SPRING hunters but more than DUCK hunters, while OTHER hunters would exhibit the lowest overall participation rates.

We emailed online surveys to 22,382 migratory bird hunters. The email surveys included questions about hunter residency, number of days hunted and light geese harvested in each zone, number of light geese harvested after 5 April in the East zone, number of light geese shot but not retrieved, and hunting methods (i.e., sneaking/jump shooting, pass shooting, over decoys, and with or without a guide

We calculated percent participation, mean number of hunt days, and mean geese harvested for each residency and hunt group (resident SPRING, SNOW, DUCK, and OTHER, and non-resident SPRING, SNOW, DUCK, and OTHER) from the survey responses. We then multiplied those by the total number of HIP registrants in each group and summed across all groups to estimate total number of LGCO participants, days spent in the field, and geese harvested.

RESULTS

Harvest Information Program

Nebraska received 30,692 HIP registrations for the 2021-2022 season, including 24,570 resident hunters and 6,122 non-resident hunters. The total number of HIP registrations increased from the 2020-2021 season ($n = 30,677$). We stratified most resident HIP registrants into the DUCK (45%) and OTHER (46%) groups based on past participation and experience. Substantially fewer HIP registrants qualified for the SNOW (8%) and SPRING (1%) groups. Non-resident Nebraska hunters exhibited similar grouping trends during stratification, with the DUCK and OTHER groups receiving 34% and 56% of HIP registrants, respectively. The SPRING (6%) and SNOW (3%) groups included fewer non-resident HIP registrants. Nebraska residents comprised approximately 80% of HIP registrants in Nebraska (Table 2).

Table 2. Resident and non-resident hunters that registered for the Harvest Information Program in Nebraska during the summer 2021-spring 2022 registration period.

	Residents	Non-Residents
SPRING	293	389
SNOW	1,883	169
DUCK	11,135	2,112
OTHER	11,259	3,452
TOTAL	24,570	6,122

Survey Responses

Participation. —We emailed surveys to 22,382 individuals from HIP that had provided email addresses and received 3,098 survey responses. The response rate was lower in 2022 (14%) than 2021 (15%). Survey responses indicated an overall participation rate of 17% ($n = 520$), with similar participation between residents and non-residents. Participation in the LGCO trended as we expected for resident and non-resident stratified groups. Participation rates were highest among SPRING hunters, followed by SNOW, DUCK, and OTHER hunters. Despite the high participation rates of resident SPRING hunters, resident SNOW and OTHER hunters spent more days in the field. SNOW, DUCK, and OTHER hunters also made larger individual contributions to the total estimate of resident harvest than SPRING hunters (Table 3). Non-resident SPRING

hunters exhibited higher participation rates than other non-resident groups, but non-resident SNOW hunters spent more days in the field and shot the most light geese per hunter. However, non-resident SPRING hunters contributed the largest number of geese to total estimates of non-resident harvest (Table 4).

Residency. —Non-resident hunters comprised 27% of all respondents in the 2022 LGCO survey, which was similar in the 2021 survey. Non-resident participants in the LGCO came from 23 states, including Colorado (31%), Utah (11%), Iowa (11%), Wyoming (8%), and Minnesota (8%). All other states contributed < 5% of total non-resident LCGO hunters.

Harvest Method. —Approximately 71% ($n = 371$) of respondents that participated in the 2022 LGCO reported using decoys to harvest light geese, and decoying accounted for 69% of reported light goose harvest (Figure 2). An additional 18% of participants indicated they used sneaking or jump shooting to target light geese; these methods accounted for 26% of reported harvest. Pass shooting (used by 9% of respondents) was used almost as frequently as jump shooting, but accounted for only 5% of reported light goose harvest. No LGCO participants indicated they had used other methods to harvest light geese. Of those participating in the 2021 LGCO, 32% ($n = 165$) indicated they hunted with a guide.

Table 3. Participation, hunt days, and harvest during the 2022 Light Goose Conservation Order, as reported on survey responses returned by resident Nebraska hunters.

Group	Percent Participating	Number of Participants	Mean Hunt Days	Mean Harvest	Total Hunt Days	Total Harvest
SPRING	71%	208	3.3	20.2	682	4,209
SNOW	72%	1,351	9.4	45.8	12,753	61,908
DUCK	10%	1,198	3.3	8.9	3,965	10,672
OTHER	7%	750	4.4	13.3	3,263	9,970
Residents	14%	3,507	6.4	27.6	20,663	86,759

Table 4. Participation, hunt days, and harvest during the 2022 Light Goose Conservation Order, as reported on survey responses returned by non-resident Nebraska hunters.

Group	Percent Participating	Number of Participants	Mean Hunt Days	Mean Harvest	Total Hunt Days	Total Harvest
SPRING	94%	366	2.7	18.9	2,051	6,925
SNOW	53%	90	6.8	23.9	608	2,154
DUCK	4%	94	4.0	9.2	376	868
OTHER	5%	167	3.4	13.3	568	2,227
Non-Residents	12%	717	3.4	17.6	3,603	12,174

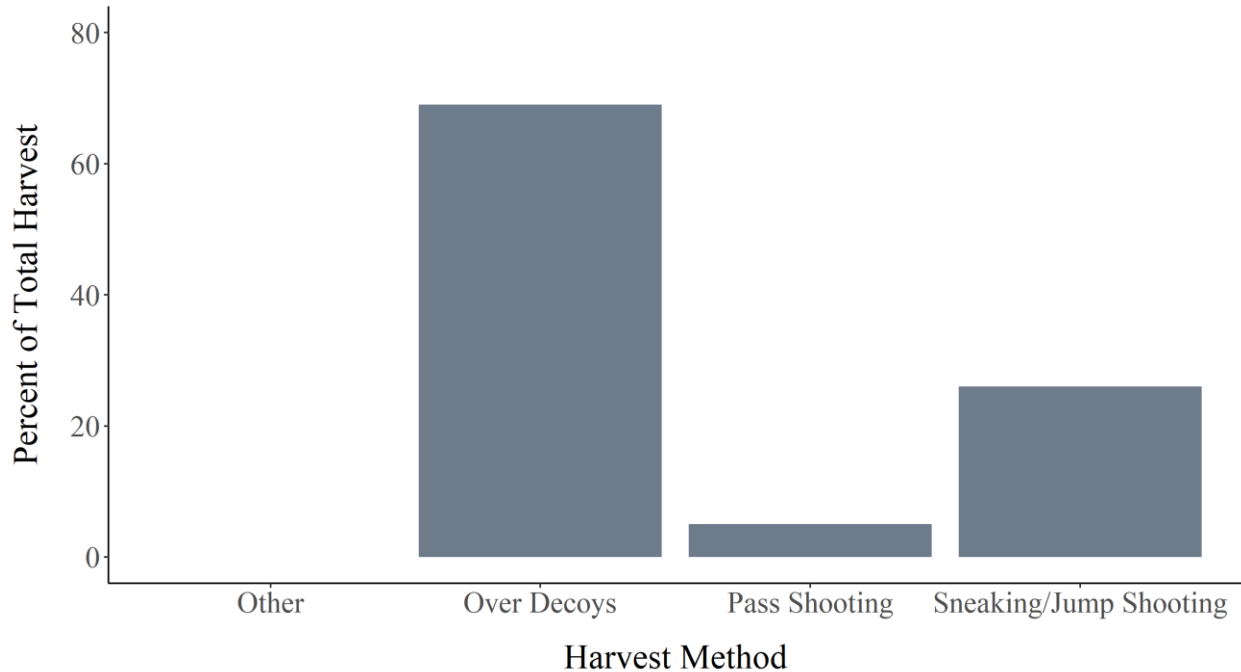


Figure 2. Percent of total estimated harvest taken by different hunting methods during the 2022 Nebraska Light Goose Conservation Order.

Hunt Zone.—Hunters participating in the LGCO targeted light geese more often in the East (46%, $n = 251$) and West (42%, $n = 228$) zones than the RWB zone (12%, $n = 64$; see Figure 1 for zone boundaries). Few participants (7%) pursued light geese in two or more zones. Light goose harvest in each zone was similar to proportion of LGCO participants hunting each zone, with 49%, 40%, and 11% of total estimated harvest occurring in the East, West, and RWB zones, respectively. The distribution of light goose harvest between zones was similar to harvest distribution in recent years (Table 5).

Table 5. Estimated percent of total harvest by zone during the Light Goose Conservation Order in Nebraska, 2015–2022.

Year	Zone		
	East	Rainwater Basin	West
2015	29%	33%	38%
2016	42%	23%	35%
2017	58%	24%	18%
2018	54%	13%	21%
2019	45%	14%	41%
2020	47%	19%	34%
2021	43%	19%	38%
2022	49%	11%	40%

Estimates of Total Participation, Hunt Days, and Harvest from Electronic Survey

We extrapolated the survey data across all HIP registrants and estimated that 4,109 hunters participated in 22,385 hunts and harvested approximately 91,647 light geese during the 2022 LGCO in Nebraska (Table 6). Estimates of total hunt days, harvest, and participants increased from 2021, but were slightly below the long-term averages (2000-2022). However, the estimated mean harvest was the third highest recorded. Non-resident hunters harvested an estimated 12% of light geese taken during the 2022 LGCO. SNOW hunters had the highest per capita harvest (42.6 geese) and days spent in the field (9.2 days), and accounted for 66% of the overall estimated harvest (Table 7).

Table 6. Estimates of total participation, hunt days, and harvest of light geese by resident and non-resident hunters during Light Goose Conservation Orders in Nebraska, 2000-2022.

Year	Estimated Number of Participants	Estimated Mean Hunt Days	Estimated Mean Harvest	Estimated Hunt Days	Estimated Harvest
2000 ^a	7,283	7.8	17.2	56,853	125,400
2001	4,624	4.2	9.5	19,501	43,974
2002	7,013	4.6	11.4	33,186	109,834
2003	7,741	3.7	12.1	26,780	87,585
2004	12,886	4.1	17.9	50,574	138,012
2005	8,104	5.2	20.2	44,057	111,172
2006	8,052	4.1	18.4	44,681	129,631
2007	5,604	4.9	20.6	32,637	96,724
2008	5,270	5.4	14.1	28,266	65,947
2009	5,609	4.6	21.7	33,566	135,247
2010	4,119	3.8	11.4	17,302	58,592
2011	5,191	4.0	21.1	26,303	156,891
2012	5,629	4.2	17.8	32,590	121,784
2013	4,022	3.8	17.8	18,620	107,283
2014	3,804	4.2	17.6	21,913	86,175
2015	5,597	4.0	17.4	25,495	106,226
2016	4,312	5.0	20.0	24,064	96,450
2017	6,001	4.9	24.7	36,024	127,897
2018	6,052	4.9	23.2	27,319	129,536
2019	3,042	4.9	11.5	15,459	30,358
2020	5,045	5.0	21.5	25,021	108,563
2021	3,509	5.0	18.3	17,720	64,377
2022	4,109	5.4	22.3	22,345	91,647
LTA^b	5,766	5.0	17.8	29,576	101,274

^aA regular hunting season was held from 2 February – 10 March 2000.

^bLong-term average from 2000-2021.

Table 7. Estimates of total number of participants, hunt days, and harvest of light geese by group during the Nebraska 2022 Light Goose Conservation Order.

Group	Estimated Number of Participants	Mean Days	Mean Harvest	Estimated Total Days	Estimated Total Harvest
SPRING	591	2.8	18.9	1,655	11,170
SNOW	1,416	9.2	42.6	13,027	60,322
DUCK	1,225	3.3	8.7	4,067	10,596
OTHER	877	4.1	10.9	3,596	9,559
TOTAL	4,109	5.4	22.3	22,345	91,647

DISCUSSION

Overall, responses to the survey indicated a significant increase in total participation, harvest, and effort between the 2021 and 2022 Conservation Orders. However, mean hunt days per participant in 2022 were relatively similar to 2021 and the long-term average (2000-2022). Mean harvest per participant was the third highest recorded, mostly due to a big increase in mean harvest of SNOW hunters. Despite dry conditions in spring 2022 that likely concentrated birds, hunters appear have been very successful hunting this year, especially hunters that have participated in past LGCO's. This is likely due to the apparent steady stream of light goose migration for an extended period of weeks from February into March.

As expected, resident SPRING hunters participated in the LGCO at higher rates than hunters in the SNOW, DUCK, and OTHER groups, however, non-resident SPRING hunters participated at a similar rate as SNOW hunters. Despite participation rates, SNOW and DUCK hunters spent more days in the field and harvested more light geese per hunter. We assigned hunters to the SPRING group based only on HIP registration dates in Nebraska. In contrast, we assigned hunters to the SNOW and DUCK groups according to HIP registration dates and evidence of previous waterfowl hunting experience. Apparent discrepancies in hunting experience and effectiveness between groups confirm the need to stratify survey respondents and HIP registrants when calculating total estimates of harvest and effort.

Presumably, our estimates of participating hunters, per capita hunt days and harvest, and total hunt days and harvest would improve with a higher survey response rate. The decrease in survey response rate between 2021 and 2022 (14% in 2022 compared to 15% in 2021) was concerning as although similar, these response rates are considerably lower than past years. Surveys are being used more frequently among wildlife professionals to assess hunter satisfaction and harvest success, but are also used daily by companies and organizations for market research, to assess customer satisfaction, etc. The constant inundation of survey requests from various sources may lead to survey fatigue, causing survey response rates among hunters to continue to decline. It may be necessary to determine a response rate or respondent sample size at which the LCGO survey is no longer effective to estimate total harvest, effort, and participation if current response trends continue.

ACKNOWLEDGEMENTS

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