2025 California Waterfowl Breeding Population Survey Report[1]

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Summary

The annual California Department of Fish and Wildlife Waterfowl Breeding Population Survey has been conducted since 1948. The survey methodology was redesigned and updated in 1991 and has been conducted in its current form since 1992. The purpose of the survey is to estimate waterfowl populations in major concentration areas of the state to inform conservation and management. Data from the survey were incorporated into the U.S. Fish and Wildlife Service Adaptive Harvest Management framework for Western mallards in 2008 and has since been an integral part of duck harvest management in the Pacific Flyway.

In 2025, the survey was conducted from April 21 – 25 in the Central Valley and May 7–8 in northeastern California. The total breeding population of ducks in the survey area increased 27% from 2024 and remains 11% below the long-term average. Mallards (*Anas platyrhynchos*) increased 49% from 2024 and are 16% below the long-term average. Gadwalls (*Mareca strepera*) increased 104% from 2024 and are 28% above the long-term average. Cinnamon teal (*Spatula cyanoptera*) decreased 21% from 2024 and are 14% below the long-term average. Canada geese (*Branta canadensis*) in northeastern California increased 81% compared to 2024 and are 43% above the long-term average.

As of June, Northern California received near to above average accumulated precipitation, Central California received below to near average accumulated precipitation, and Southern California received below average accumulated precipitation. Statewide water storage levels of major reservoirs are at or above historical average for all but San Luis Reservoir, which is 88% of its historical average. Water allocations for wetland management are 100% for all Central Valley Project management areas. Water allocation to the Klamath Basin National Wildlife Refuge Complex in northeastern California is currently unknown, however water deliveries are expected to remain limited. Other areas in northeastern California should have adequate water supply for wetland management.

[1] Data are preliminary.

Methods

The procedures used in conducting the California Department of Fish and Wildlife (CDFW) Waterfowl Breeding Population Survey (hereafter California Survey) generally follow those set forth in the U.S. Fish and Wildlife Service (USFWS) Standard Operating Procedures Manual (SOP) for the Waterfowl Breeding Population and Habitat Conditions Survey (USFWS and Canadian Wildlife Service 1987). Survey design and SOPs for the California Survey are as follows:

Strata — The original survey included 11 strata which were: Sacramento Valley, Sacramento – San Joaquin Delta, San Joaquin Grasslands, San Joaquin Desert, Suisun Marsh, Napa and Santa Rosa Valleys, Salinas Valley, Owens Valley, Northeastern California, East Valley (i.e., Central Valley) and West Valley (i.e., Central Valley; Zezulak et al. 1991). Salinas and Owens Valleys were discontinued after 1994; therefore, population estimates in this report only include data from the nine strata currently surveyed (Fig. 1).

Survey Timing — In the Central Valley and Suisun Marsh, about half of all duck nests are initiated by the last week of April. A range of 48–54 days existed between 10% and 90% of nest initiation in the Suisun Marsh during five years of study (McLandress et al. 1996). In northeastern California, nest initiations are later due to the increase in latitude, higher elevations, and correspondingly cooler temperatures. About 50% of mallard nests in northeastern California are initiated by mid-May (Zezulak et al.1991). Based upon these regional nesting chronologies, surveys are conducted during the latter half of April in the Central Valley and by mid-May in northeastern California.

Survey flights are scheduled to begin no later than two hours after sunrise to ensure adequate lighting and avoid detection problems. Surveys are completed no later than 1400 hours, which facilitates use of Sacramento Executive Airport as a daily stopping point (except in northeastern California).

Survey Sample — The California Survey consists of nine strata (Fig.1; see Zezulak et al. 1991). A stratum is a defined geographic unit encompassing areas of similar waterfowl densities and is generally of a single or unique complex of habitat type(s). Most strata are continuous spatial units except the Northeastern stratum, where mountainous terrain separates each wetland complex (Fig. 1).

A transect is the sampling unit of the California Survey, which can have multiple segments, be continuous and / or disjunct. Segments are a subunit of a transect, most of which total 18 statute miles (29 km), except in the Suisun Marsh, Napa-Santa Rosa and Northeastern strata. Segments in these areas are disjunct as they are designed to fit within the geographic features of the valleys (i.e., Napa-Santa Rosa and Northeastern) or to provide a representative sample of areas surveyed before the 1991 redesign (i.e., Suisun Marsh and Northeastern).

Survey Flight Path — Transects within the Central Valley are oriented 45° from true north. Most waterways in the Central Valley are oriented north-south or east-west, and the prescribed orientation is intended to minimize biases associated with transects that might run parallel or perpendicular to waterways. Latitude and longitude coordinates define each segment's beginning and ending points.

Transect Placement — A randomly selected starting point for generating transects within the Central Valley was established just south of Red Bluff. Segments through most of the Central Valley are located at parallel 14 mi (22.5 km) intervals, except in the San Joaquin Desert where segments are spaced 28 mi (45 km) apart due to low waterfowl densities. East and West Valley starting points were randomly selected and transects were placed between the border of the intensive agricultural areas of the Central Valley and the 500 ft (152 m) elevation line.

Fixed-wing Flight Procedure — The California Survey requires one CDFW pilot and two CDFW observer-biologists. The pilot's responsibility is navigation, including waypoint delineation of segment beginning and ending points. The pilot maintains an air speed of 90–110 mph (145–180 km/hr.) and an altitude of 150 ft (45 m) above ground level. Each observer counts all ducks, geese, mute swans, American coots (*Fulica americana*) and Sandhill cranes (*Antigone canadensis*) within 660 ft (200 m) on each side of the aircraft, creating a total sample width of 1/4 mi (400 m). Observations are recorded using a voice recorder.

Visibility Bias Correction — Several factors (e.g., flight speed, vegetation) preclude ground coverage of most segments. Therefore, the California Survey uses the double-sampling procedure (Koneff et al. 2008), similar to the USFWS SOP. This method incorporates a "complete count" of select segments to correct for detection bias, referred to as a visibility correction factor (VCF). A helicopter is used to obtain the VCF in California. The VCF is conducted in all strata except the Napa-Santa Rosa stratum. Segments were selected based on the relative abundance of waterfowl, representative habitats, and proximity to airports.

Helicopter Flight Procedure — The VCF crew consists of two CDFW observer-biologists and a CDFW helicopter pilot. The helicopter is flown at 40–45 mph (65–70 km/hr.) and an altitude of 100 ft (30 m) along segments. The helicopter crew records waterfowl in the same manner as fixed-wing observers.

Data Analysis — Both fixed-wing and VCF crews use hand-held voice recorders to document waterfowl observations. Crews then manually transcribe observations from sound files (.mp3) to a CSV file and edited based on criteria in Appendix I. Once data are finalized, population estimates are generated using a customized program in R (G. Zimmerman USFWS 2015; R-Core Team 2025, R Studio Team 2025).

A "total indicated birds" (TIB) is calculated for each species on survey segments from both fixed-wing and helicopter data using criteria from previous research (Zezulak et al. 1991, Appendix I). The VCF is calculated for each species based on the ratio of TIB from the fixed-wing crew divided by the TIB from the helicopter crew on replicated segments. The current year VCF is compared to long-term VCF estimates at various pooling levels (e.g., 2 years, 5 years, 10 years, etc.), as well as the USFWS long-term average (LTA) in the midcontinent. The current year VCF is used if specific criteria are met (Appendix II). The long-term average (CDFW or USFWS) is used for uncommon species (e.g., redhead, *Aythya americana*). A density is derived by dividing the TIB by the segment area (mi^2). A mean density is calculated for each species within each stratum by averaging the densities of each transect. The stratum area for expansion is calculated by subtracting the transect area surveyed (i.e., segment area) from the stratum area. The mean density for each species is multiplied by the VCF then by the

expansion factor to derive a population estimate for each stratum.

Results

The 2025 California Survey was flown from 21 – 25 April in the Central Valley and 7 – 8 May in northeastern California. Transect-segment 2-3 in the Napa-Santa Rosa stratum was not flown due to dense fog. Transect-segment 7-20 in northeastern California was not flown due to high winds. The survey was 98% complete in the Central Valley and 95% complete in northeastern California for a total survey effort of 97%.

Total breeding ducks in the survey area increased 27% from 2024 (474,495 ± 50,323) and 11% below LTA (Table 1). The most abundant duck species were mallards (265,640 ± 39,610), gadwall (110,172 ± 27,589), cinnamon teal (36,271 ± 8,851), and northern shoveler (34,765± 9,692). These species comprised 94% of ducks observed. Mallards increased 49% from 2024 and are 16% below LTA. Gadwalls are 104% above 2024 and 28% above LTA. Cinnamon teal decreased 21% from 2024 and are 14% below LTA. Northern shovelers were 26% below 2024 and are 0.5% below LTA.

Other, less numerous, duck species present in the survey include American green-winged teal (*Anas carolinensis*), American wigeon (*Anas americana*), northern pintail (*Anas acuta*), wood duck (*Aix sponsa*), canvasback (*Aythya valisineria*), redhead, bufflehead (*Bucephala albeola*), lesser scaup (*Aythya affinis*), ring-necked duck (*Aytha collaris*), and ruddy duck (*Oxyura jamaicensis*). These species comprised 6% of total ducks (Table 1).

Other species observed during the survey included: American coots, Canada geese, sandhill cranes and mute swans (*Cygnus olor*; Table 1). Statewide estimates for American coots decreased 16% from 2024 (220,364 ± 80,174) and are 10% below LTA (Table 1). Canada geese are counted in all strata (Appendix IV); however, the Northeastern stratum is used to monitor the traditional breeding population within California. Canada geese in the Northeastern stratum increased 81% from 2024 (62,034 ± 17,442) and are 43% above LTA. Sandhill cranes also nest in the Northeastern stratum and are down 25% from 2024 (3,382 ± 2,240) and are 49% above LTA. In 2007, CDFW began monitoring feral mute swans. Mute swan estimates increased 79% from 2024 (12,350 ± 7,811) and are 605% above their 18-year average.

The winter of 2024 and spring of 2025 brought near average precipitation throughout most of the State. Winter snowfall was below average from November to February, with spring storms making up the deficit in March and April. Snow-water content in the Northeastern stratum overall was 12% below average (Table 2; Natural Resource Conservation Service 2025).

Discussion

Statewide precipitation through the end of June 2025 was about 95% of average; with Northern California near to above average, Central California below to near average and Southern California below average precipitation (California Department of Water Resources 2025). Water allocations in the Sacramento Valley were forecasted at full allotment for wetland management and rice planting which should benefit breeding waterfowl in the region.

Unlike the complex water storage and conveyance systems of the Central Valley, northeastern California wetland habitat is reliant on annual precipitation; mainly snowfall and the timing and duration of snowmelt to feed wetland habitats. Tule Lake and Lower Klamath National Wildlife refuges (TLNWR and LKNWR) received enough water to fill both Sump 1A and 1B wetland units on TLNWR and multiple units on LKNWR, creating ideal conditions for production. Unfortunately, these conditions were short lived and started to decline after the nesting season began. Wetland levels have dropped at TLNWR with increasing demand on water supply and numerous wetlands at LKNWR were drawn down to release water into the Klamath river to improve water quality for listed fish species and to support agricultural irrigations. Very limited water deliveries have increased the threat of toxic algal blooms and avian disease (J. Vradenburg, USFWS, personal communication).

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Figure 1. California Breeding Waterfowl Population Survey map.

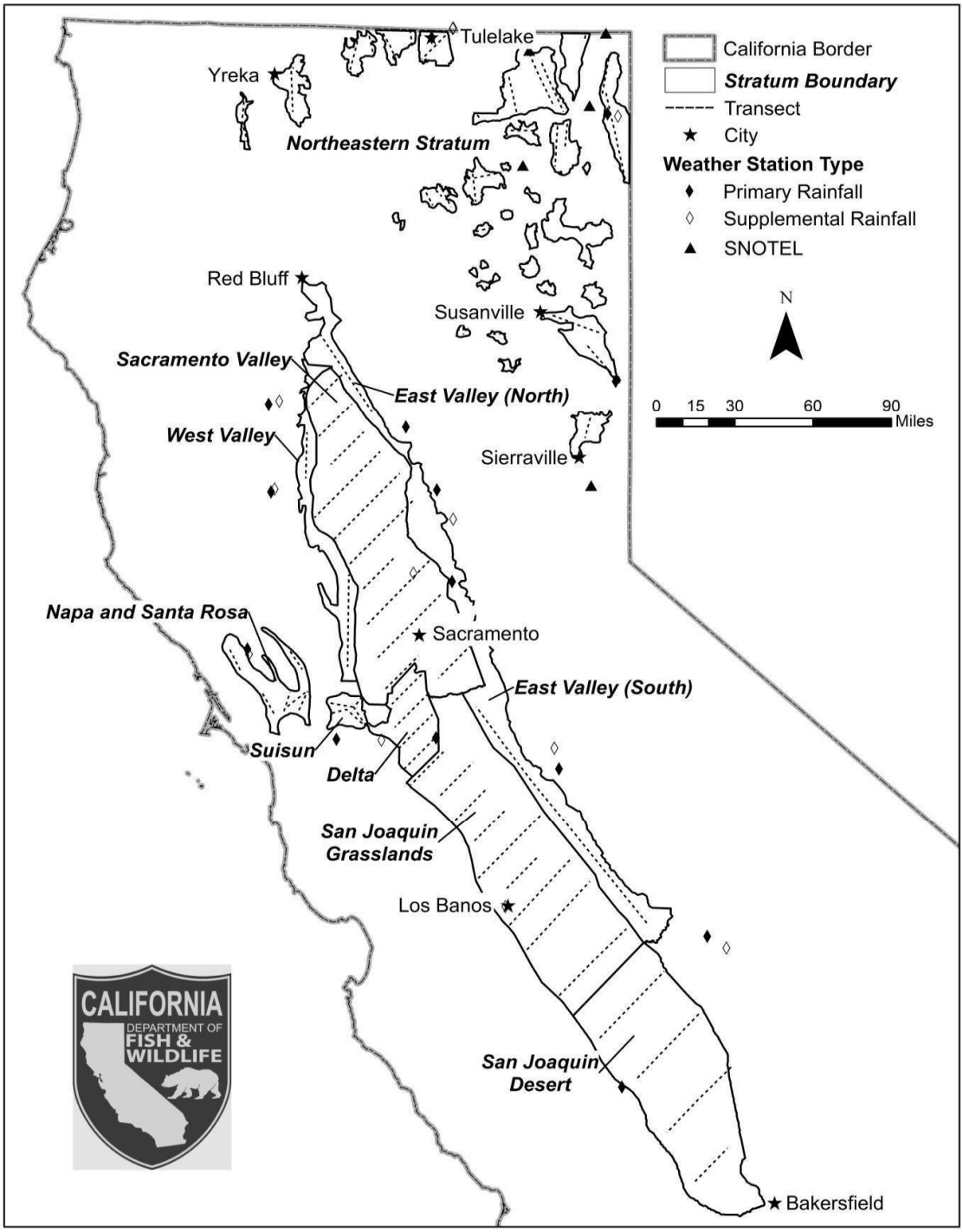

Table 1. California Breeding Waterfowl Population Survey estimates and standard errors.

Species	2025	SE	CV	2024	SE	LTA[1]	% Change 2024	% Change LTA
Mallard	265,640	39,610	0.15	177,828	21,576	317,835	49%	-16%
Gadwall	110,172	27,589	0.25	54,011	11,946	85,957	104%	28%
American Wigeon	4,052	1,796	0.44	1,573	825	4,407	158%	-8%
Green-winged Teal	703	702	1.00	2,493	1,811	4,227	-72%	-83%
Cinnamon Teal	36,271	8,851	0.24	46,097	20,415	42,064	-21%	-14%
Northern Shoveler	34,765	9,692	0.28	47,015	16,994	34,928	-26%	0%
Northern Pintail	7,310	2,862	0.39	18,349	9,765	7,328	-60%	0%
Wood Duck	2,057	965	0.47	10,577	5,344	7,969	-81%	336%
Redhead	3,343	2,440	0.73	7,981	5,137	4,153	-58%	-20%
Canvasback	433	454	1.05	0	0	1,090	-	-60%
Lesser Scaup	377	396	1.05	0	0	4,265	-	-91%
Ring-necked Duck	327	185	0.57	0	0	926	-	-65%
Bufflehead	7,778	3,104	0.40	2,093	790	3,431	272%	-127%
Ruddy Duck	1,267	1,089	0.86	5,847	4,661	14,628	-78%	-91%
TOTAL DUCKS	**474,495**	**50,323**	**0.11**	**373,864**	**99,264**	**533,208**	**27%**	**-11%**
Canada Geese[2]	62034	17442	0.28	34,242	10,048	43,298	81%	43%
American Coot	220,364	80,174	0.36	262,447	195,193	243,587	-16%	-10%
Sandhill Crane[2]	3,382	2,240	0.66	4,481	2,985	2,264	-25%	49%
Mute Swan[3]	12,350	7,811	0.63	6,912	3,838	1,752	79%	605%

[1]Long-term average (LTA); 1992 – 2025 for ducks and coots.
[2]Northeastern stratum estimates only, LTA for Canada geese = 1993 – 2025, LTA for Sandhill cranes = 2003 – 2025
[3]Mute swan LTA = 2003 – 2025.

Table 2. Snow-water content (inches)[1] across the Northeastern survey stratum, 2025.

Location	Nov	Dec	Jan	Feb	Mar	Apr	Season Average	April Z-Score	% of April Average
Adin Mountain[2]	0.0	1.7	3.4	8.2	12.5	15.5	7.1	1.06	86%
Adin Mountain LTA	0.8	3.1	6.5	9.4	11.5	8.9	6.7		
Cedar Pass	0.2	2.0	4.3	11.1	15.4	23.1	9.4	-0.02	49%
Cedar Pass LTA	1.2	4.3	8.3	12.0	15.4	15.5	9.4		
Dismal Swamp	0.0	4.1	8.3	18.3	26.8	36.4	15.7	0.01	33%
Dismal Swamp LTA	1.7	6.8	13.3	19.3	25.1	27.4	15.6		
Independence Lake	0.7	2.9	7.0	13.9	28.7	42.6	16.0	-0.78	-2%
Independence Lake LTA	2.4	9.1	18.3	27..4	37.1	43.3	22.9		

[1]Data from NRCS snow telemetry stations, see Figure 1 for locations and Appendix III for additional information.
[2]LTA 1990–2025.

Appendix I. Guidelines for California Breeding Waterfowl Survey data

Definitions

Total Indicated Birds:	Drakes, Pairs and Groups combined.
Lone Drake:	Single isolated drake without a visible associated hen.
Flocked Drakes:	Four or fewer drakes in close association.
Pair:	Male and female in close association.
Group:	Five or more of mixed-sex grouping of the same species in close association that cannot be separated into singles and pairs.

Total Indicated Birds = Lone drakes x 1, Pairs x 2, Groups x 1 (AOU_Num)

- Redhead (1460): exclude groups greater than 8
- Ring-necked Duck (1500)
- Lesser Scaup (1490): do not count in Napa and Suisun Strata
- Ruddy Duck (1670)
- Canada Goose (1720): count all broods separately
- Greater white-fronted goose (1710)
- American Coot (2210)
- Sandhill Crane (2060)
- Mute Swan (1782)

Total Indicated Birds = Lone drakes x 2, Pairs x 2, Flocked Drakes x 2, Groups x 1

- Common Merganser (1290)
- Mallard (1320)
- Gadwall (1350)
- American Wigeon (1370): exclude groups
- American Green-winged Teal (1390): exclude groups greater than 8
- Cinnamon Teal (1410)
- Northern Shoveler (1420): exclude groups
- Northern Pintail (1430)
- Wood Duck (1440)
- Canvasback (1470): exclude groups
- Common Goldeneye (1510)
- Bufflehead (1530)
- Blue-winged Teal (1400)

Appendix II. Guidelines for Determining Annual Visibility Correction Factor (VCF).

California VCFs are to be used for most species. The preference is for the current year VCF to reflect habitat or general conditions, especially for mallards. Sample size and Coefficient of Variation (CV) rule: at least 40 observations for the helicopter and fixed wing crews with a CV of 20% or less. If VCF is 1.0 or less do not use. If current year does not meet criteria, use previous year until criteria are met. Pooling can be used if criteria cannot be met, and single year estimate is deemed not reasonable (VCF of 1.5 or less for mallards). In the case of scaup, ring-neck duck, mergansers, and goldeneye (species with few detections/low abundances in California) use U.S. Fish and Wildlife Service VCF.

Appendix III. Weather station metadata.

Station Name	Station ID	Stratum	Type	Latitude	Longitude	Notes
Dismal Swamp	SNOTEL: 446	Northeastern	Snow	41.9900	-120.1800	Main Station
Independence Lake	SNOTEL: 541	Northeastern	Snow	39.4300	-120.2800	Main Station
Adin Mountain	SNOTEL: 301	Northeastern	Snow	41.2400	-120.7900	Main Station
Cedar Pass	SNOTEL: 391	Northeastern	Snow	41.5800	-120.3000	Main Station

Appendix IV. Population estimates of mallards, gadwall, cinnamon teal and Canada geese by stratum, 1992–2025. SV = Sacramento Valley, DE = Sacramento–San Joaquin Delta, SJD = San Joaquin Desert, SJG = San Joaquin Grasslands, SM = Suisun Marsh, NSR = Napa-Santa Rosa, NE = Northeastern, EV = East Valley, WV = West Valley (see Fig. 1). LTA = long-term average.

Mallards

Year	SV	DE	SJD	SJG	SM	NSR	NE	EV	WV	TOTAL
1992	163,030	12,453	5,075	79,859	29,713	8,969	44,634	23,687	8,423	375,843
1993	129,527	8,602	25,643	63,203	21,847	9,731	69,231	28,901	2,323	359,008
1994	114,249	10,143	17,097	52,107	18,104	10,160	66,166	17,483	6,183	311,692
1995	111,410	10,184	24,056	71,188	22,705	14,731	80,861	23,969	9,422	368,526
1996	205,040	18,519	12,033	105,438	26,523	20,231	92,032	43,230	12,511	535,557
1997	186,048	8,089	25,207	114,370	23,054	11,496	79,169	51,927	15,585	514,945
1998	148,754	6,741	17,917	54,344	18,349	11,582	67,978	21,957	12,906	360,528
1999	259,325	5,832	16,693	70,724	22,127	14,174	144,884	17,748	8,556	560,063
2000	147,384	11,263	23,327	39,461	8,882	10,278	83,373	17,249	6,341	347,558
2001	122,509	12,141	6,093	33,014	10,881	10,148	96,756	7,413	3,249	302,204
2002	116,758	7,816	8,728	29,121	10,066	13,672	64,754	8,229	6,151	265,295
2003	106,957	12,176	16,362	58,323	16,669	11,974	87,611	19,714	7,270	337,056
2004	97,422	6,303	14,421	28,513	14,092	10,881	70,321	14,474	5,998	262,425
2005	100,143	9,459	11,345	42,739	10,883	18,342	98,220	22,057	4,681	317,869
2006	120,808	8,196	10,679	53,264	12,077	21,486	128,612	37,242	7,073	399,437
2007	104,601	8,319	20,904	47,590	15,691	32,915	131,267	20,061	6,976	388,324
2008	92,539	6,465	17,165	51,548	10,330	15,516	85,824	13,689	4,054	297,130
2009	105,141	4,943	15,818	39,981	9,094	12,265	95,913	14,651	4,153	301,959
2010	102,139	3,948	14,371	56,255	14,531	16,137	128,600	16,586	15,325	367,892
2011	100,972	7,293	17,693	38,956	21,501	18,057	87,095	17,697	5,450	314,714
2012	85,641	10,136	33,456	57,816	14,486	11,058	138,315	22,645	8,369	381,922
2013	80,903	5,929	18,323	33,418	11,580	13,436	120,132	12,325	2,590	298,636
2014	67,914	3,826	8,445	44,586	8,901	6,156	90,820	5,850	2,168	238,666
2015	55,086	9,452	6,568	24,349	9,704	7,541	54,182	1,998	4,986	173,866
2016	69,389	9,240	7,015	33,952	13,668	8790	99,520	16,122	6,079	263,774
2017	31,134	6,151	14,913	21,386	9,921	10918	86,637	13,143	4,188	198,392
2018	56,915	4,850	12,520	36,929	14,150	17363	109,991	17,749	2,393	272,859
2019	49,307	6,085	7,893	31,049	13,625	15217	97,628	14,447	4,580	239,831
2022	32,478	6,823	7,206	18,186	9,019	8542	83,564	11,108	2,465	179,393
2023	44,938	9,138	10,620	34,708	10,163	12295	67,124	9,951	3,169	202,108
2024	26,695	6.970	9.353	16,169	10,630	13,230	84,097	9,815	868	177,828
2025	42,447	5,320	6,385	23,717	13,132	10,475	147,942	12,053	4,168	265,640
LTA	102,425	8,213	14,479	47,071	14,878	13,368	93,227	18,287	6,208	318,154
% Δ 2024	59%	-24%	-32%	47%	24%	-21%	76%	23%	380%	49%
% Δ LTA	-59%	-35%	-56%	-50%	-12%	-22%	59%	-34%	-33%	-17%

Appendix IV. Continued…

Gadwall										
Year	SV	DE	SJD	SJG	SM	NSR	NE	EV	WV	TOTAL
1992	2,332	0	2,416	12,701	4,098	2,853	9,873	0	0	34,274
1993	3,654	0	4,544	9,187	4,620	2,484	41,850	461	0	66,800
1994	2,084	0	2,776	10,852	5,370	2,368	29,909	338	0	53,696
1995	2,927	175	2,729	9,566	9,178	5,461	64,133	0	252	94,421
1996	3,214	0	2,725	20,205	10,462	6,615	45,434	1,326	0	89,982
1997	8,147	405	7,387	13,230	11,024	15,474	36,903	1,926	0	94,496
1998	8,826	0	5,065	11,096	9,045	2,908	41,167	385	585	79,078
1999	20,160	184	2,870	11,995	5,894	6,403	40,389	4,539	0	92,434
2000	5,369	848	8,247	19,255	7,363	8,116	54,162	358	272	103,989
2001	3,731	0	580	8,208	4,056	7,419	44,568	0	0	68,560
2002	4,506	215	3,026	6,118	4,952	4,742	34,814	818	155	59,345
2003	8,572	495	2,579	11,471	5,986	6,767	40,362	1,568	238	78,037
2004	3,819	134	2,933	12,993	6,797	5,361	42,716	1,020	0	75,773
2005	11,455	0	3,561	12,600	9,273	14,309	128,158	0	0	179,356
2006	12,910	376	5,873	14,647	7,953	5,973	74,324	0	271	122,326
2007	6,216	463	6,159	8,547	5,445	9,152	101,041	661	0	137,686
2008	10,601	250	3,382	6,225	4,317	3,841	39,751	633	0	69,000
2009	13,950	120	2,995	8,580	6,852	11,299	63,200	2,505	0	109,502
2010	5,861	452	2,829	9,015	5,780	3,460	55,128	0	238	82,763
2011	6,042	206	8,693	11,176	7,450	9,981	73,263	1,371	298	118,479
2012	6,116	322	2,684	4,070	5,442	5,393	27,500	408	0	51,936
2013	4,259	741	4,303	3,123	4,679	3,474	52,874	805	153	74,410
2014	15,113	0	8,688	9,890	5,516	3,167	50,650	235	0	93,259
2015	14,492	123	1,545	4,425	3,103	2,407	30,721	939	535	58,290
2016	9,432	495	3,849	3,379	4,647	5,613	30,316	470	179	58,380
2017	777	116	5,768	5,600	5,308	4,206	49,603	220	167	71,765
2018	10,778	0	3,160	5,691	6,100	8,450	68,244	214	0	102,637
2019	9,822	125	3,104	6,814	4,914	6,287	79,781	474	0	111,321
2022	8,388	811	842	4,548	4,090	3,819	53,892	0	0	76,391
2023	12,242	1,217	13,470	13,930	4,152	2,895	39,831	514	0	88,251
2024	1,810	617	4,320	3,242	2,968	4,716	36,338	0	0	54,011
2025	8,515	149	465	3,455	5,546	1,959	88,948	1,135	0	110,172
LTA	7,691	282	4,174	9,245	6,012	5,855	52,183	729	104	86,276
% Δ 2024	370%	-76%	-89%	7%	87%	-58%	145%	-	-	104%
% Δ LTA	11%	-47%	-89%	-63%	-8%	-67%	70%	56%	-100%	28%

Appendix IV. Continued…

Cinnamon Teal										
Year	SV	DE	SJD	SJG	SM	NSR	NE	EV	WV	TOTAL
1992	3,226	385	3,611	19,469	2,149	395	28,505	2,928	0	60,668
1993	3,332	0	4,972	10,890	2,497	1,223	30,591	2,268	0	55,773
1994	4,846	321	4,017	16,585	1,793	329	22,388	1,222	0	51,503
1995	4,575	195	5,486	14,380	3,402	1,000	18,117	3,893	282	51,330
1996	22,944	1,666	4,466	15,300	3,987	4,883	27,305	5,885	2,407	88,842
1997	5,381	917	10,872	14,012	1,280	470	13,649	1,308	0	47,889
1998	3,843	229	2,151	11,113	533	235	15,979	1,744	0	35,828
1999	9,450	410	4,487	12,096	1,335	841	10,716	390	0	39,725
2000	2,979	0	3,472	2,340	930	456	14,512	0	0	24,689
2001	4,019	266	1,666	5,053	496	273	13,926	507	385	26,592
2002	1,789	0	2,086	3,936	807	547	4,843	0	0	14,008
2003	4,353	0	2,436	6,019	1,329	799	13,459	988	0	29,382
2004	3,485	0	1,857	7,511	2,764	305	18,975	565	0	35,461
2005	6,056	0	4,274	7,613	1,363	1,602	14,106	2,971	0	37,984
2006	10,318	362	2,264	11,445	2,021	743	26,285	4,131	0	57,570
2007	2,039	243	2,282	2,563	1,358	749	28,965	1,851	0	40,050
2008	7,054	0	1,462	9,853	1,849	719	21,724	445	0	43,105
2009	7,483	235	1,469	7,922	328	241	32,748	447	0	50,872
2010	2,856	170	5,860	11,849	872	175	22,884	3,564	246	48,478
2011	11,347	271	10,158	10,841	1,260	1,944	26,339	1,545	0	63,704
2012	5,125	278	869	2,343	2,198	855	14,932	0	0	26,600
2013	4,594	548	857	1,732	1,020	281	13,528	0	0	22,560
2014	2,871	734	0	5,157	1,366	502	19,774	465	0	30,870
2015	13,127	0	0	1,547	1,594	1,506	10,407	0	354	28,534
2016	2,465	245	2,288	1,545	1,684	1,730	18,868	1,396	0	30,221
2017	410	245	1,523	3,087	897	0	26,883	930	0	33,975
2018	4,102	0	3,047	4,630	3,140	1,871	60,779	930	0	78,498
2019	3,013	674	2,098	3,306	2,059	680	37,731	853	0	50,415
2022	1,299	194	0	3,257	2,042	2,442	13,795	0	0	23,028
2023	1,948	387	3,015	10,179	976	1,185	15,419	368	0	33,477
2024	355	212	19,117	890	1,650	1,619	22,254	0	0	46,097
2025	3,389	449	699	2,361	1,647	1,359	24,446	1,920	-	36,271
LTA	5,127	301	3,527	7,526	1,645	999	21,401	1,360	115	42,000
% Δ 2024	855%	112%	-96%	165%	0%	-16%	10%	-	-	-21%
% Δ LTA	-34%	49%	-80%	-69%	0%	36%	14%	41%	-100%	-14%

Appendix IV. Continued…

Canada Geese										
Year	SV	DE	SJD	SJG	SM	NSR	NE	EV	WV	TOTAL
1993	590	0	0	0	98	72	50,405	134	0	51,299
1994	354	0	0	0	0	0	59,291	468	0	60,113
1995	708	0	0	0	0	72	53,060	0	0	53,840
1996	236	0	0	0	0	72	45,298	0	0	45,606
1997	1,651	457	0	74	147	216	32,735	134	51	35,466
1998	884	141	0	0	33	216	68,929	936	559	71,699
1999	649	0	0	3,261	229	974	96,673	268	508	102,562
2000	1,592	35	0	0	180	902	47,903	134	0	50,745
2001	1,474	739	0	741	131	1,804	52,754	0	1,067	58,709
2002	825	317	0	371	0	1,118	47,136	1,338	203	51,308
2003	1,297	106	0	519	115	1,154	32,495	1,806	203	37,695
2004	354	176	0	296	65	2,706	27,424	401	0	31,422
2005	1,484	169	0	711	0	3,113	36,230	561	1,035	43,302
2006	0	0	0	0	20	130	19,792	0	244	20,185
2007	356	567	0	0	0	291	31,629	337	154	33,333
2008	189	150	0	238	0	0	9,874	0	0	10,451
2009	4,338	0	0	0	0	0	31,989	703	0	37,030
2010	860	0	0	541	0	865	13,999	1,394	1,324	18,983
2011	4,670	330	0	618	512	2,068	36,248	4,253	794	49,493
2012	3,855	0	0	308	459	2,209	41,926	4,651	1,951	55,359
2013	3,327	551	0	929	342	1,998	68,248	4,473	956	80,823
2014	3,049	296	0	2,496	197	1,692	31,209	3,378	183	42,499
2015	2,623	254	0	267	79	2,169	44,322	1,609	794	52,117
2016	8,377	423	264	2,226	175	2,477	44,323	3,619	796	62,679
2017	7,211	313	0	1,233	287	2,603	55,224	3,268	2,091	72,230
2018	4,064	587	243	1,151	556	1,554	54,851	3,491	1,582	68,079
2019	7,943	1,377	0	2,384	501	5,106	48,588	3,615	1,463	70,977
2022	4,075	1,195	0	3,898	340	997	46,359	5,478	1,786	64,128
2023	4,973	906	0	3,378	113	1,323	60,353	4,304	2,263	77,613
2024	14,538	1,098	360	4,011	371	1,237	34,242	6,698	2,924	65,480
2025	8,965	221	343	695	303	1,780	62,034	6,388	80	80,809
LTA	3,081	336	39	979	169	1,320	44,695	2,059	742	53,420
% Δ 2024	-38%	-80%	-5%	-83%	-18%	44%	81%	-5%	-97%	23%
% Δ LTA	191%	-34%	779%	-29%	79%	35%	39%	210%	-89%	51%