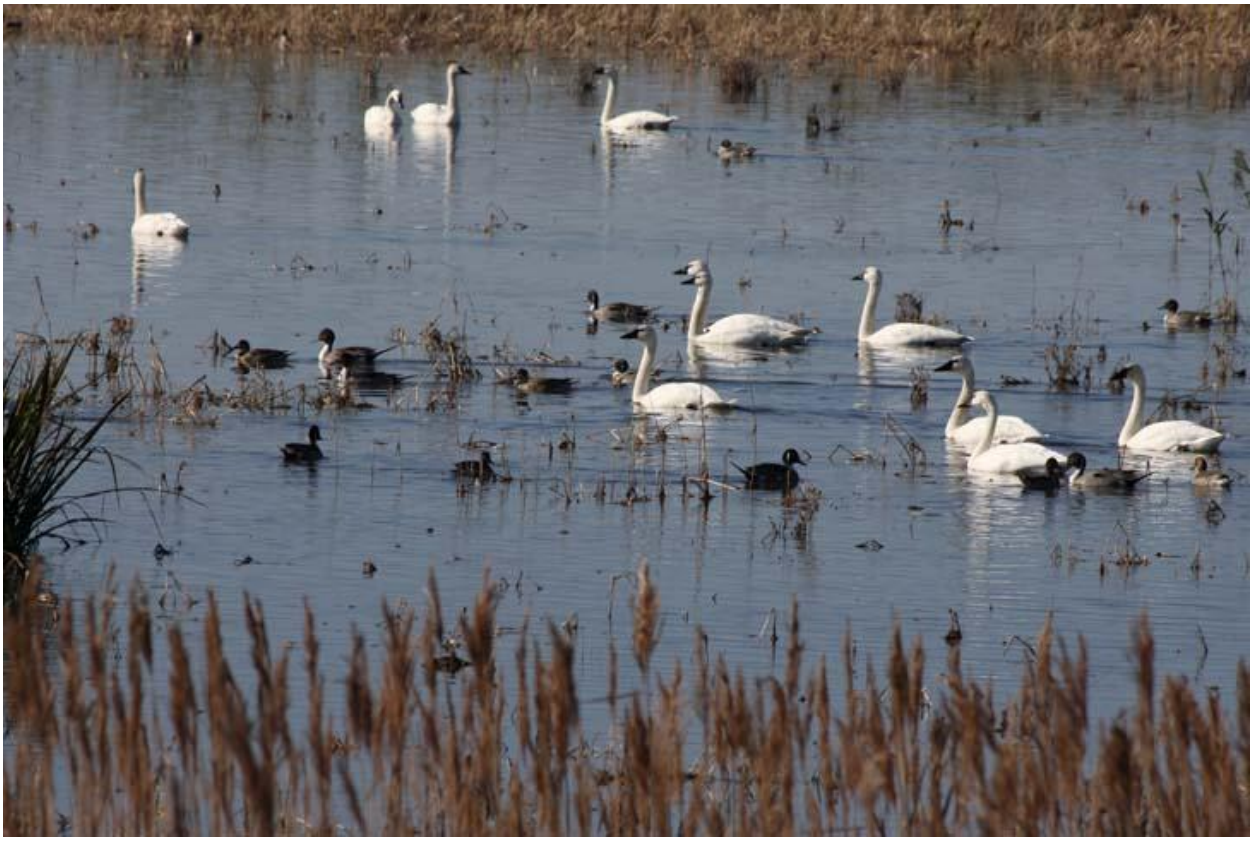
2010-11 North Carolina Tundra Swan Season
Harvest & Survey Report



Prepared by:

Doug Howell
Waterfowl Biologist
Division of Wildlife Management
Surveys and Research Section
April 20, 2011

The twenty-sixth North Carolina tundra swan season occurred in 2010-11. The season length was 68 days beginning November 13, 2010 and running through January 31, 2011, excluding Sundays. Participation was limited to hunters holding one of 5,000 randomly drawn permits. A total of 6,632 persons applied for the 5,000 available permits, the highest applicant pool on record. Permit holders were allowed to harvest one tundra swan per season. Youth with a valid permit were allowed to harvest a tundra swan on Youth Waterfowl Day. This seasonôs Youth Waterfowl day was held on Saturday, February 5, a week after the close of the regular duck season. All permit holders were mailed a paper tag and a harvest questionnaire. Upon harvest, successful hunters were required to immediately cut out the date of kill on the paper tag and affix it to the birdsô tarsus. All hunters were required to complete the questionnaire (Figure 1) and submit it to the Wildlife Resources Commission no later than April 1, 2011. Those permit holders not responding by this date will be ineligible for a permit the following tundra swan season in 2011-12. A postage paid envelope was provided to return the questionnaire via US mail. Hunters also had the option of completing the questionnaire online on the Commissionôs website. A second harvest questionnaire was mailed on February 28, 2011 to 1,369 permit holders not responding to the original questionnaire. A ten-dollar processing fee was charged for tundra swan permits in 2010-11.

The questionnaire survey was the primary means employed to obtain hunter participation and harvest data. No formal bag checks were conducted due to the length of the season, the large hunt area and the limited participation. Encounters with swan hunters by state wildlife management personnel (incidental to other field activities) or by enforcement personnel during routine waterfowl regulations enforcement results in only limited information on hunter participation and success. Data on tundra swan numbers and distribution was gathered in January, 2011 during the Atlantic Flyway Mid-winter Waterfowl Survey (AFMWS). The AFMWS is conducted annually in cooperation with the U.S. Fish and Wildlife Service (USFWS). The AFMWS included traditional water census routes and agricultural areas used by swans.

The response rate for the 2010-11 questionnaire survey was 93% (4,626 respondents). This extremely high response rate is attributed to rules enacted by the Commission which makes non-responders ineligible for a permit the following season. Respondents continued to increase their utilization of the Commissionôs online reporting system. Forty-three percent of respondents

elected to submit the data online rather than using other reporting methods (i.e. mail, by phone, or in person). This represents an increase of 22% over 2009-10 and a 138% increase since the online reporting system was established in 2006-07.

Data on hunter effort determined from the questionnaire surveys for all years are presented in Table 1. An estimated 4,246 hunters hunted 9,758 hunter days. Based on the estimated retrieved harvest, the success rate was 51%. The estimated retrieved harvest and estimated total kill were approximately 13% higher than the 2009-10 season, and slightly above (8-10%) the average of years when only 5000 permits were issued (1996-97 through 2009-10) (Table 2.). An estimated 2,619 tundra swans were killed during the 2010-11 season (includes birds not retrieved), and was the second highest harvest on record during the time when only 5000 permits were issued. Seventeen percent of the reported harvest was composed of juvenile swans. Since the first year county of kill data was collected (1996-97 season), the proportional harvest within reporting counties has remained consistent (Table 3). Hyde, Washington, Currituck, and Tyrrell counties again accounted for the majority of the harvest (75%).

Beginning in 2004, the aerial surveys traditionally flown in mid-November and late January were discontinued. Since that time, estimates of tundra swan numbers and distribution are based solely on the December Goose, Brant, and Swan Survey (GBSS) and AMWS. The GBSS was not flown in 2010 due to pilot availability. Both surveys are conducted in cooperation with the US Fish and Wildlife Service or with assistance from private contract pilots. The AFMWS was flown on January 3-9, 2011 by WRC staff, primarily Doug Howell and Joe Fuller, with assistance from Perry Sumner, Ken Knight and David Stewart. A total of 69,501 tundra swans were observed. This is similar to the numbers observed during the 2009-10 mid-winter survey and was 13% above the 1981-82 to 2009-10 long-term average.

2010-11 North Carolina Tundra Swan Questionnaire

Please complete this questionnaire online at www.ncwildlife.org or return using the enclosed postage-paid envelope (do not mail if you complete the information online. **NOTE: Failure to return or complete this questionnaire online by April 1, 2010 will make you ineligible for a tundra swan permit during the 2010-11 swan hunting season.**

Fill in the blanks: Permit No.

1. How many days did you hunt swans? _____
2. Did you kill a swan this season? ☐ Yes ☐ No
3. The head and neck feathers were: ☐ Nearly all white ☐ Gray colored
4. County of kill: _____
5. Did you knock down any swan(s) that you could not retrieve? ☐ Yes, how many ____ ☐ No
6. Did you kill a banded swan? If so, please report band numbers here:
   Leg-Band _____ Neck-band _____ and to the Bird Banding Lab at 1-800-327-BAND or www.reportband.gov

Permit No:

Figure 1. 2010-2011 North Carolina tundra swan questionnaire.

Table 1. Hunter effort in the North Carolina tundra swan seasons, as determined by mail surveys, 1984-85 through 2010-11.

Year	*Permits Issued*	*Total Estimated Hunters*	*Total Hunter Days*	*Days/ Hunter*
1984-85	1000	867	2837	3.27
1985-86	6000	5080	15213	2.99
1986-87	6000	4888	14794	3.03
1987-88	5968	5014	14042	2.80
1988-89	5995	4729	11965	2.53
1989-90	5444	4446	10047	2.26
1990-91	5989	4859	11127	2.29
1991-92	6000	4849	10860	2.24
1992-93	5961	4675	10082	2.16
1993-94	6000	4802	10950	2.28
1994-95	6000	4790	11082	2.31
1995-96	6000	4776	11223	2.35
1996-97	4960	3773	9083	2.41
1997-98	5000	3892	9501	2.44
1998-99	5000	3762	9473	2.52
1999-00	5000	3836	9101	2.37
2000-01	5000	4047	10169	2.51
2001-02	5000	3997	9705	2.43
2002-03	5000	3951	8996	2.28
2003-04	5000	4257	9579	2.25
2004-05	5000	3958	9809	2.48
2005-06	5000	4180	10066	2.41
2006-07	5000	4074	10131	2.49
2007-08	5000	4126	9765	2.37
2008-09	5000	4244	9658	2.28
2009-10	5000	4322	10563	2.44
2010-11	**5000**	**4246**	**9758**	**2.30**
Change from Previous Year		-1.76%	-7.62%	-5.97%
Average from 1996-97 through 2009-10 [1]		4029	9684	2.40
% change from 1996-97 through 2009-10 average		5.38%	0.77%	-4.43%

[1] this includes years where # of permits available = 5000.

Table 2. Hunter success in the North Carolina tundra swan seasons, as determined from mail surveys, 1984-85 through 2010-11.

Year	*Reported Retrieved Harvest*	*Estimated Retrieved Harvest*	*Estimated Total Kill*	*Retrieved Harvest/ Hunter Day*
1984-85	136	313	334	0.110
1985-86	2362	2523	2783	0.166
1986-87	2103	2302	2579	0.156
1987-88	2498	2684	3007	0.191
1988-89	2224	2468	2739	0.206
1989-90	1737	2128	2364	0.212
1990-91	2620	2855	3108	0.257
1991-92	2663	2940	3169	0.271
1992-93	2342	2609	2886	0.259
1993-94	2224	2773	2994	0.253
1994-95	3822	3750	3949	0.338
1995-96	2448	2833	3193	0.252
1996-97	1948	2177	2301	0.240
1997-98	1894	2325	2505	0.245
1998-99	1891	2363	2440	0.249
1999-00	1658	2290	2353	0.252
2000-01	2041	2515	2702	0.247
2001-02	1815	2322	2501	0.239
2002-03	2069	2363	2479	0.263
2003-04	1977	2355	2479	0.246
2004-05	1476	1745	1828	0.178
2005-06	2184	2436	2575	0.242
2006-07	2135	2291	2388	0.226
2007-08	2194	2313	2372	0.237
2008-09	2400	2501	2590	0.259
2009-10	2145	2239	2322	0.212
2010-11	**2411**	**2535**	**2619**	**0.260**
Change from Previous Year	12.40%	13.22%	12.79%	22.56%
Average from 1996-97 through 2009-10 [1]	1988	2302	2417	0.238
% change from 1996-97 through 2009-10 average	21.30%	10.11%	8.38%	9.07%

[1] this includes years where # of permits available = 5000.

Table 3. Distribution by county of reported tundra swan harvest from the 2010-11 North Carolina tundra swan questionnaire survey.

County	Swans Reported[1]	Percent of Total Harvest	Cumulative Harvest
Hyde	968	39.70	39.70
Washington	302	12.39	52.09
Currituck	298	12.22	64.32
Tyrrell	258	10.58	74.90
Beaufort	165	6.77	81.67
Pasquotank	101	4.14	85.81
Carteret	60	2.46	88.27
Dare	51	2.09	90.36
Pamlico	46	1.89	92.25
Chowan	40	1.64	93.89
Bertie	38	1.56	95.45
Perquimans	30	1.23	96.68
Camden	23	0.94	97.62
Edgecombe	15	0.62	98.24
Halifax	13	0.53	98.77
Northampton	11	0.45	99.22
Hertford	9	0.37	99.59
Clay	2	0.08	99.67
Lenoir	2	0.08	99.75
Franklin	1	0.04	99.79
Hoke	1	0.04	99.84
Lenoir	1	0.04	99.88
Pender	1	0.04	99.92
Sampson	1	0.04	99.96
Watauga	1	0.04	100.00
Total	2438	100.00	100.00

[1] total swans reported may not equal reported retrieved harvest listed in Table 2 because some hunters do not list county of harvest.

Table 4. Tundra swans observed in aerial surveys in North Carolina, 1981-82 through 2010-11.

Year	*Mid November*	*Mid December*	*Early January* (mid-winter survey)	*Late January*
1981-82	9347	38459	42200	NS [1]
1982-83	33390	42897	51065	55010
1983-84	1563	49835	44100	NS
1984-85	92335	60500	61500	NS
1985-86	14960	53113	52505	50729
1986-87	51635	49949	53127	44800
1987-88	27908	46388	46800	54046
1988-89	60069	69571	50588	56868
1989-90	60251	51256	60238	76724
1990-91	48790	62795	64999	56254
1991-92	56812	58863	75607	60302
1992-93	45908	46424	45930	46249
1993-94	36150	52354	54662	53294
1994-95	24034	55300	54974	NS
1995-96	50324	50377	50716	NS
1996-97	66980	54272	57730	62621
1997-98	41021	44586	63755	62930
1998-99	60266	66880	83106	65518
1999-00	41699	54196	77044	75452
2000-01	30698	85503	66966	62619
2001-02	17620	56235	78394	65521
2002-03	35925	86315	83351	NS
2003-04	64295	85415	67188	NS
2004-05	NS	NS	47364	NS
2005-06	NS	NS	54064	NS
2006-07	NS	46252	72928	NS
2007-08	NS	77333	69023	NS
2008-09	NS	48139	76788	NS
2009-10	NS	75071	70273	NS
2010-11	**NS**	**NS**	**69501**	**NS**
Change from Previous Year	NA	NA	-1%	NA
Previous Average [2]	42260	57431	61275	59309
Change from Ave.	NA	NA	13%	NA

[1] NS = No survey; NA = Not applicable.

[2] average from 1981-82 through 2009-10 or last year surveyed.