

STATE: DELAWARE

GRANT: W37R-10

## **ANNUAL REPORT**

GRANT TITLE: WILDIFE INVESTIGATIONS – WATERFOWL

GRANT PERIOD: OCTOBER 1, 2008 – SEPTEMBER 30, 2010



**STATE:** Delaware

**GRANT NUMBER AND TITLE:**

W 37-R Wildlife Investigations - Waterfowl

**OBJECTIVE:**

To maintain waterfowl populations at sustainable and socially acceptable levels while maximizing recreational use of the resource.

**JOB NUMBER AND TITLE:**

Job 1. Migratory Bird Inventories, Banding, Parts Collection and Parts Analysis

**JOB OBJECTIVE:**

To cooperate with the U.S. Fish and Wildlife Service (USFWS) and the Atlantic Flyway Council Technical Section (AFCTS) as follows:

To conduct aerial waterfowl surveys

To trap and band migratory birds, including doves.

To conduct Singing-ground Surveys to establish an index of American woodcock breeding numbers.

To conduct Call-count Surveys to establish an index of mourning dove breeding numbers.

To participate in the waterfowl parts analysis workshop.

To assist in the collection of dead waterfowl or parts as requested for evaluation of disease or toxic materials.

**ACTIVITY:**

Monthly aerial waterfowl surveys were conducted by Delaware Division of Fish and Wildlife personnel from October 2008 through January 2009. Survey dates were: 6, 7 October, 11, 12 November, and 16, 18 December. The mid-winter waterfowl survey was flown on 5, 9, 11, January 2009. Though no waterfowl banding was conducted during this job segment, 115 mourning doves were banded as part of the National Mourning Dove Banding Study. American woodcock Singing-ground Surveys, although requested by the USFWS, were not conducted because all DE routes are current in 'constant zero' status. Two mourning dove Call-count Surveys were conducted during this segment on 5 and 6 June 2009 at the request of the USFWS.

An aerial inventory of resident geese in Delaware was flown between 8 July and 14 July 2009 to document the number of birds present in the state at that time. Data was expanded to correct for visibility. No correction for reproduction was included as the survey was flown at the end of the nesting season.

**TARGET DATE:**

September 30, 2008 - Note: per U.S Fish and Wildlife Service approval this target date has been extended to June 30, 2010.

**STATUS:**

On schedule - per approved extension.

**REMARKS:**

In 2009, no routes were surveyed for American woodcock because all DE routes (DE-018, DE-017, DE-014) are in 'constant zero' status. Mourning dove call counts were conducted along two routes, DE-0091 and DE-0100, and the total number of doves seen along each route was 8 and 9, respectively. (*Note: Final reports for the American woodcock Singing-ground Surveys and mourning dove Call-count Surveys will be published by the U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Laurel, Maryland.*)

As a cooperator in the mourning dove national banding study and wing collection survey 115 doves were banded across the state during July and August 2009 and the data were submitted to the Bird Banding Laboratory. During 1-12 September 2009, collection barrels were placed on state wildlife areas open to dove hunting to collect parts from hunter harvested doves. Approximately 150 wings were submitted to the Division of Migratory Bird Management (DMBM).

A preseason banding program was initiated in Delaware in July 2009, with a priority on banding black ducks in support of the Black Duck Joint Venture's Northeast Preseason Black Duck Banding Program. Division personnel worked with staff at Prime Hook National Wildlife Refuge to identify suitable trapping locations. Baiting activities were unsuccessful in attracting black ducks due to interference from the large resident Canada goose population present on site resulting in no ducks being banded. Delaware intends to attempt preseason banding activities in 2010 and expand trapping sites to include Bombay Hook NWR and nearby state wildlife areas.

Aerial waterfowl count data are used by DFW to evaluate seasonal waterfowl movements and abundance. In addition, January survey data were submitted to the USFWS as part of the Midwinter Survey. Counts for October 2008 through January 2009 are included as Tables 1-4. Survey zone boundaries are shown in Figure 1.

Canada goose population levels by month are shown in Table 5. Canada goose population levels were below 2007-08 levels by 25,000 geese in October, 19,000 geese in November, and 20,000 geese in January, but were 25,000 birds above December estimates from the same time last year. Goose population estimates from 2008-09 remain below pre-decline (1976-1980) estimates for all monthly survey periods except December, which was 30% above the pre-decline mean (Table 5). However, when compared to the short-term, 10-year mean population (1998-2007), Canada geese population estimates for 2008-09 were below average for

all months except December (Table 5). The main concentrations of Canada Geese were found in Zones 1, 3, 5, and 6.

Snow goose population estimates from the 2008-09 surveys were above 2007-08 estimates for all monthly survey periods by 48% to 296% except October, which showed a 94% decrease from the year before (Table 6). Early season (October and November) population estimates were considerably lower when compared to the 10-year (1998-2007) population mean, with 106,000 to 133,000 fewer geese observed during the 2008-09 survey period (Table 6). However, late season (December and January) estimates were above the 10-yr mean, especially the December estimate, which was 52,000 geese above the mean estimate (Table 6). Snow geese were most abundant in the central part of the state (Zones 4, 5, 6, and 7), primarily in association with the Bombay Hook and Prime Hook National Wildlife Refuges and the Little Creek/Ted Harvey Wildlife Management Areas.

The total number of ducks observed during 2008-09 survey period was below average compared to monthly mean numbers observed during the previous 10-year period (1998-2007; Figure 2). The observed numbers of ducks were especially low in October and November, down 73% and 76% respectively, compared to the preceding 10-year mean (Figure 2). This observed decrease was driven primarily by fewer observed northern pintail (Figure 3) and American green-winged teal (Figure 4). While the number of ducks observed in December was 28% below the short-term, 10-year average; the number observed in January 2009 was consistent with this short-term average.

American green-winged teal (hereafter teal), northern pintail, mallard, and American black duck (hereafter black duck) were the most abundant species observed during the 2008-2009 survey period (Tables 1-4) and during the short-term trend period (1999-2007)(Figure 5). In October and November, teal and northern pintail are the most abundant duck species in Delaware, but observed numbers usually decline dramatically by December as these birds migrate further southward (Figures 3, 4 and 5). Conversely, late season migrants such as mallards, black ducks, and diving ducks (e.g. ring-necked ducks and ruddy ducks), continue to increase in abundance during the fall, and reach peak observed numbers in December and January (Figures 5, 6, and 7). Observed numbers of pintail in 2008-09 were below the short-term, 10-yr mean for all monthly surveys, especially for October and November, which were 63% and 84% below average, respectively (Figure 3). Similarly, teal numbers for the 2008-2009 survey period were also lower compared to 1999-2007 estimate, most notably during October (-83%) and November (-86%; Figure 4). Mallard numbers were below average for all monthly surveys except December, which was consistent with the 10-yr mean (Figure 6). Black duck numbers were 3% to 61% (October) below average for all months except December, which was 9% above the 10-yr mean estimate (Figure 7).

A statewide aerial survey of resident Canada geese was conducted between 8 July and 14 July 2009. All potential goose habitat including wetlands, agricultural, residential, and industrial tracks were examined (Figure 8). A total of 7,288 adult and juvenile geese were observed (Table 7). Observed estimates were expanded by 2X to correct for lack of visibility due to vegetative cover. The total statewide population of resident geese was estimated to be 14,576 birds in 2009. The 2009 survey estimate represents a 50% increase from the 9,690 birds estimated in the 2008 survey. Survey results for 2009 indicate an increase in resident goose numbers in 5 of the 6 units surveyed, most especially in Units B, D and F, where a high degree of residential development is occurring.

The increase in resident Canada geese in 2009 occurred even though the 2008 September resident goose season was experimentally extended ten days from 1-15 September to 1-25 September. The preliminary HIP harvest estimate for Delaware's 25-day, 2008 September resident goose season was 2,200 geese, only a 5% increase compared to the 15-day 2007 season estimate of 2,100 geese. The total harvest of Canada geese (resident and migratory) in Delaware increased by 30%, from an estimated 21,996 geese in 2007 to 28,637 birds in 2008.

**RECOMMENDATIONS:**

This job should be continued as most aspects are in cooperation with the USFWS and the Atlantic Flyway Council Technical Section (AFCTS). The resident Canada goose survey should be conducted annually while Delaware's 10-day experimental extension of the September resident Canada goose season is being evaluated and while resident Canada geese population levels in both Delaware and the Atlantic Flyway continue to remain above population goals.

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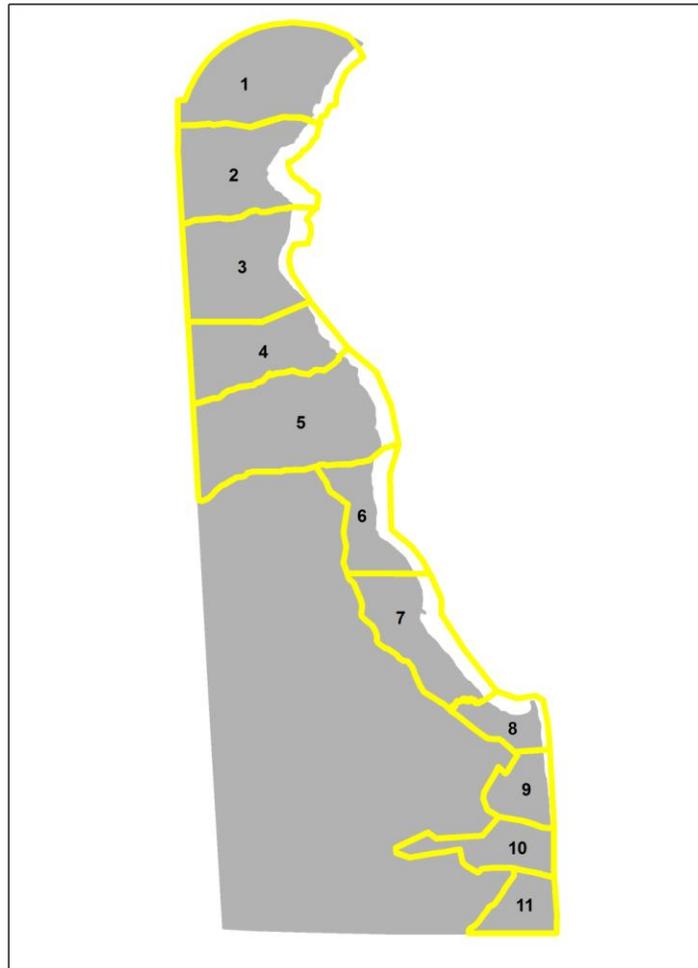


Figure 1. Waterfowl aerial survey zones:

- 1 (Statewide) PA line south to DE Memorial Bridge
- 2 (Statewide) DE Memorial Bridge to C&D Canal
- 3 (Statewide) C&D Canal to line from Liston Point to Kenton
- 4 (Statewide) Liston Point to Route 6 (Smyrna)
- 5 (Statewide) Route 6 (Smyrna) to Route 8 (Port Mahon)
- 6 (East of Route 113) Route 8 to Big Stone Beach
- 7 (East of Route 1) Big Stone Beach to Broadkill River
- 8 (East of Route 1) Broadkill River to Lewis-Rehoboth Canal, south of Gordon's Pond
- 9 South of Gordon's Pond and all of Rehoboth Bay
- 10 All Indian River Bay west to Millsboro and south to Salt Pond
- 11 Salt Pond south to MD line and west to Route 17

Table 1. Delaware aerial waterfowl count - OCTOBER 6, 2008, by species, for eleven sampling units.

Species	01	02	03	04	05	06	07	08	09	10	11	Totals
Black Duck			72	91	685	176	333		8		49	1,414
Mallard		37	120	1,177	552	169	183		5	4	2	2,249
Pintail			25	25	3,578	141	6,475					10,244
Green-Winged Teal		15	455	834	760	1,360	4,657	33	2	60	12	8,188
Blue-Winged Teal						1						150
Gadwall							6					6
Shoveler				12	54	14		77			15	172
Wood Duck						22	4					26
Ruddy Duck								35				35
<b>Total Ducks</b>		52	672	2,139	5,629	2,032	11,658	145	15	64	78	22,484
Snow Goose				304	2,183	1	1,200					3,688
Canada Goose		547	4,080	2,557	3,344	1,621	1,008	172	376	360	133	14,198
<b>Total Geese</b>		547	4,080	2,861	5,527	1,622	2,208	172	376	360	133	17,886
Brant									26			
Mute Swan			5								3	8
<b>Grand Total</b>		599	4,757	5,000	11,156	3,654	13,866	317	417	424	211	40,378

Table 2. Delaware aerial waterfowl count – 11 NOVEMBER 2008, by species, for eleven sampling units.

Species	01	02	03	04	05	06	07	08	09	10	11	Totals	
Black Duck		29	183	67	1,004	789	1,219	97	326	72	326	4,112	
Mallard	316		141	253	3,108	631	140	21	5	12	71	4,698	
Pintail				512	8,325	700	6,780	20			502	4,124	
Green-Winged Teal		2		225		3,038	1,410	1,095	90	30		40	5,930
Gadwall					656	303	304		20		42	1,325	
Wigeon					20		192					212	
Shoveler	430		25		529	120	124	18	4			1,250	
Wood Duck					2	8	199					209	
Ring-necked Duck						36						36	
Ruddy Duck	300								15			315	
Bufflehead			66						35	280	22	403	
<b>Total Ducks</b>	<b>1,048</b>	<b>29</b>	<b>745</b>	<b>340</b>	<b>10,966</b>	<b>3,317</b>	<b>4,141</b>	<b>226</b>	<b>435</b>	<b>364</b>	<b>1,003</b>	<b>22,614</b>	
Snow Goose			10,000		19,188		18,420	1,000				48,608	
Canada Goose	1,010	571	6,096	3,308	5,068	1,880	1,108	482	682	404	102	20,711	
<b>Total Geese</b>	<b>1,010</b>	<b>571</b>	<b>16,096</b>	<b>3,308</b>	<b>24,256</b>	<b>1,880</b>	<b>19,528</b>	<b>1,482</b>	<b>682</b>	<b>404</b>	<b>102</b>	<b>69,319</b>	
Brant									26			26	
Tundra Swan			5		17		20					42	
Mute Swan	3	11	3			1					4	22	
<b>Grand Total</b>	<b>2,061</b>	<b>611</b>	<b>16,849</b>	<b>3,648</b>	<b>35,239</b>	<b>5,198</b>	<b>23,689</b>	<b>1,708</b>	<b>1,143</b>	<b>768</b>	<b>1,109</b>	<b>92,023</b>	

Table 3. Delaware aerial waterfowl count – 16 DECEMBER 2008, by species, for eleven sampling units.

Species	01	02	03	04	05	06	07	08	09	10	11	Totals
Black Duck	33		255	267	1,339	3,896	1,894	376	375	484	1,340	10,259
Mallard	10	217	689	992	5,489	2,203	555	177	74	112	159	10,677
Pintail					3,339	112	640				170	4,261
Green-Winged Teal						215	270	40				525
Gadwall					405	601	103				200	1,309
Wigeon					3	40		12			83	126
Shoveler	570		10		231	1,250	365	145				2,571
Wood Duck				3			26		15			44
Canvasback									350			250
Scaup	100											100
Scoter							25					25
Ruddy Duck			80		2	5	91	55	36	977	1	1,247
Bufflehead			30		6	300		6	246	574	175	1,337
<b>Total Ducks</b>	<b>713</b>	<b>217</b>	<b>1,064</b>	<b>1,262</b>	<b>11,029</b>	<b>8,677</b>	<b>3,739</b>	<b>759</b>	<b>1,096</b>	<b>2,147</b>	<b>2,128</b>	<b>32,831</b>
Snow Goose			2,080	21,445	44,025	61,000	84,520	1,305				214,375
Canada Goose	17,595	5,276	14,233	5,197	9,684	6,429	2,616	2,416	1,108	2,321	2,492	69,367
<b>Total Geese</b>	<b>17,595</b>	<b>5,276</b>	<b>16,313</b>	<b>26,642</b>	<b>53,709</b>	<b>67,429</b>	<b>87,136</b>	<b>3,721</b>	<b>1,108</b>	<b>2,321</b>	<b>2,492</b>	<b>283,742</b>
Brant									163	335		498
Tundra Swan			25		44		58					127
Mute Swan	9	25										34
<b>Grand Total</b>	<b>18,317</b>	<b>5,518</b>	<b>17,402</b>	<b>27,904</b>	<b>64,782</b>	<b>76,106</b>	<b>90,933</b>	<b>4,480</b>	<b>2,367</b>	<b>4,803</b>	<b>4,620</b>	<b>317,232</b>

Table 4. Delaware aerial waterfowl count – 5 JANUARY 2009, by species, for eleven sampling units.

Species	01	02	03	04	05	06	07	08	09	10	11	Totals
Black Duck	127	103	527	294	1,366	2,997	2,021	368	186	289	1,094	9,372
Mallard	70	300	1,068	882	10,558	2,224	597	200	60	104		16,063
Pintail				6	3,557	20		60		10	160	3,643
Green-Winged Teal						300	220					520
Gadwall		60	2		130	681	326	2				1,201
Wigeon			20		10	30	150	5		1	200	416
Shoveler	1,250		120		100	750	140	250		50		2,660
Canvasback									320			320
Ring-necked Duck				20								20
Merganser			4	2	60				8	8		82
Ruddy Duck			150			41		66		200		457
Bufflehead	20		25		43		148	11	89	128	8	472
Long-tailed Duck									3		4	7
<b>Total Ducks</b>	<b>1,467</b>	<b>463</b>	<b>1,916</b>	<b>1,204</b>	<b>16,124</b>	<b>6,963</b>	<b>3,382</b>	<b>962</b>	<b>666</b>	<b>780</b>	<b>1,306</b>	<b>35,233</b>
Snow Goose			3,000	3,200	32,962	46,075	42,802	10,575	230	5,000	200	144,044
Canada Goose	3,894	4,394	12,206	3,280	12,125	1,648	3,888	2,421	850	462	2,730	47,898
<b>Total Geese</b>	<b>3,894</b>	<b>4,394</b>	<b>15,206</b>	<b>6,480</b>	<b>45,087</b>	<b>47,723</b>	<b>46,690</b>	<b>12,996</b>	<b>1,080</b>	<b>5,462</b>	<b>2,930</b>	<b>191,942</b>
Brant									4	215		219
Tundra Swan			48		154	4	13			4		223
Mute Swan	3	15										18
<b>Grand Total</b>	<b>5,364</b>	<b>4,872</b>	<b>17,170</b>	<b>7,684</b>	<b>61,365</b>	<b>54,690</b>	<b>50,085</b>	<b>13,958</b>	<b>1,750</b>	<b>6,461</b>	<b>4,236</b>	<b>227,635</b>

Table 5. Comparison of 2008-2009 population estimate of Canada geese (in thousands) to pre-decline (1976-1980) and 10-year (1998-2007) mean estimates for each monthly survey period in Delaware.

Survey Period	Year											$\bar{X}_1$	% $\Delta$	$\bar{X}_2$	% $\Delta$
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	<b>2008</b>	(1976-1980)	(1997-2006)		
October	40	20	27	44	51	32	32	25	37	39	14	147	-90%	35	-60%
November	45	34	64	49	62	38	40	45	40	40	21	57	-63%	46	-54%
December	43	46	56	65	55	66	71	39	60	44	69	53	30%	55	27%
January	112	61	123	64	95	91	67	74	57	68	48	56	-14%	81	-41%

Table 6. Comparison of 2008-2009 population estimate of snow geese (in thousands) to 10-year (1998-2007) mean estimate for each monthly survey period in Delaware.

Survey Period	1998	1999	2000	2001	2002	Year 2003	2004	2005	2006	2007	<b>2008</b>	$\bar{x}$ (1998-2007)	% $\Delta$
October	280	193	141	128	113	59	78	15	24	68	4	110	-96%
November	255	343	126	195	228	328	99	92	124	33	49	182	-73%
December	145	152	255	199	129	230	89	145	222	54	214	162	32%
January	62	61	169	123	167	169	52	155	193	92	144	124	16%

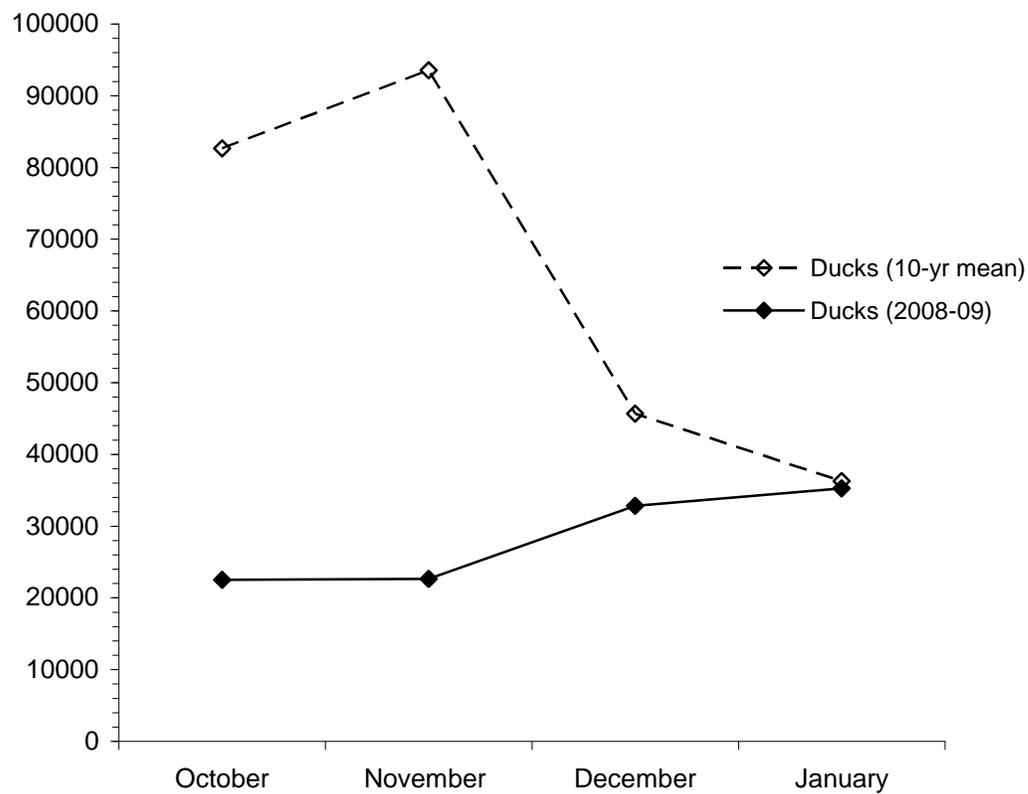


Figure 2. Total number of ducks observed during the 2008-09 survey period compared to the mean number of ducks observed during the previous ten years (1998-2007) in Delaware

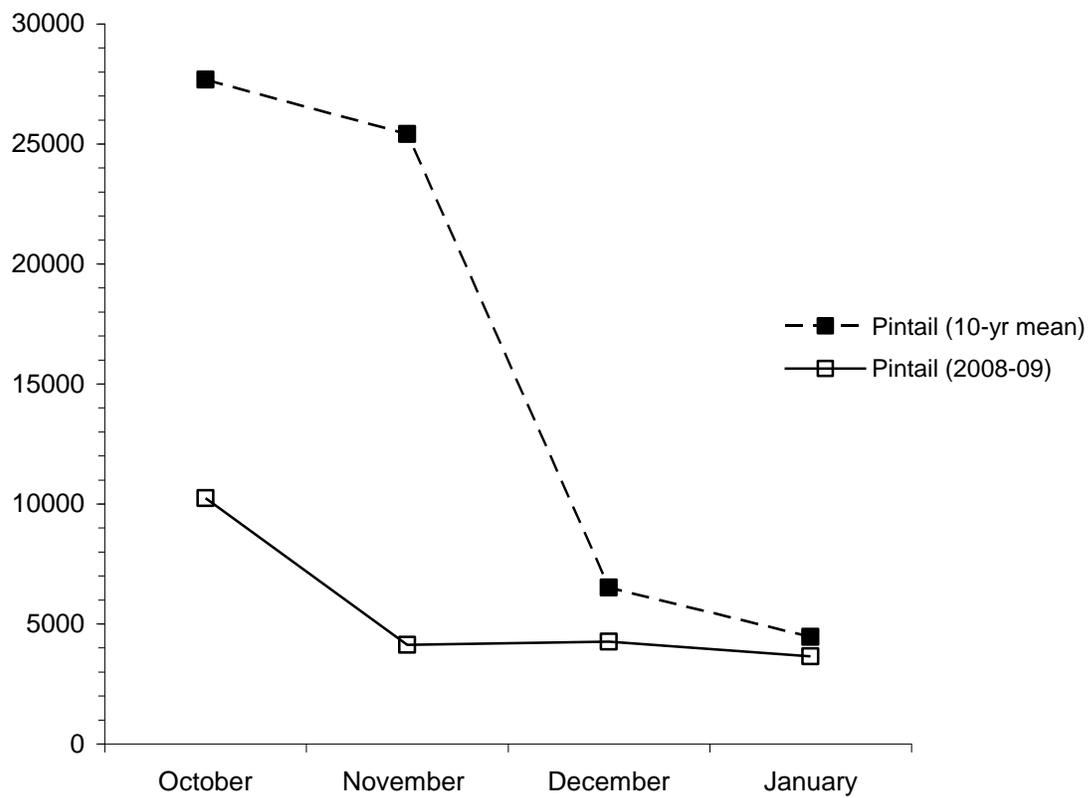


Figure 3. Number of northern pintail observed during the 2008-09 survey period compared to mean number observed during the previous ten years (1998-2007) in Delaware.

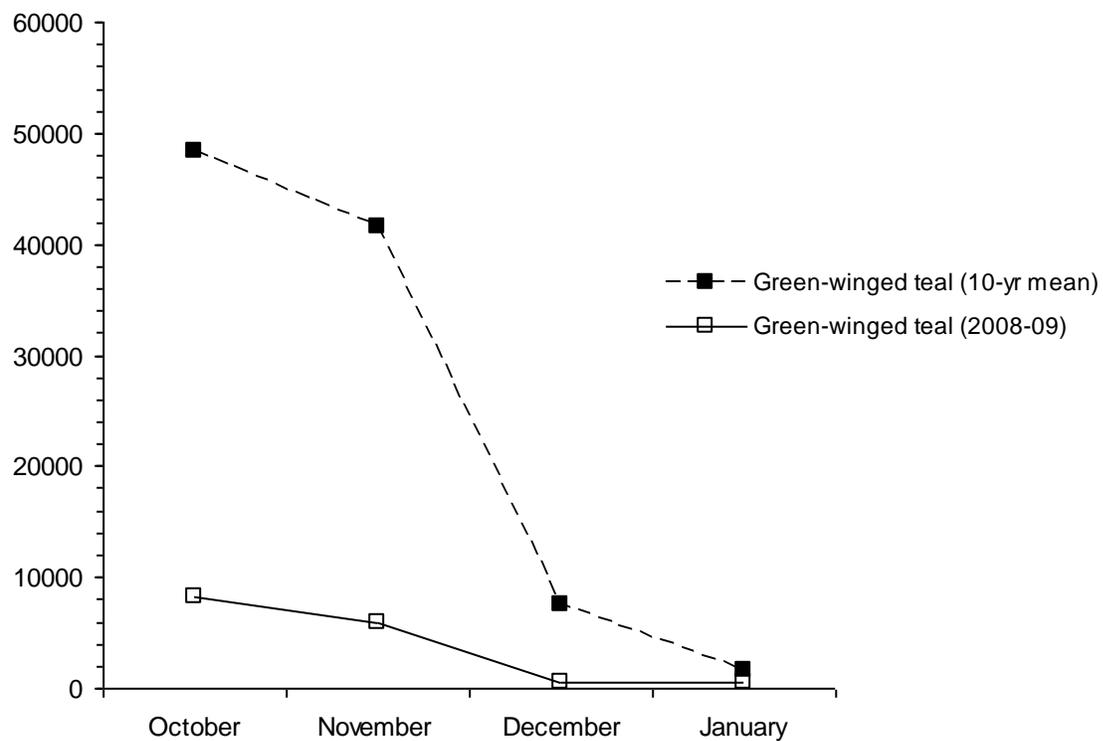


Figure 4. Number of American green-winged teal observed during the 2008-09 survey period compared to mean number observed during the previous ten years (1998-2007) in Delaware.

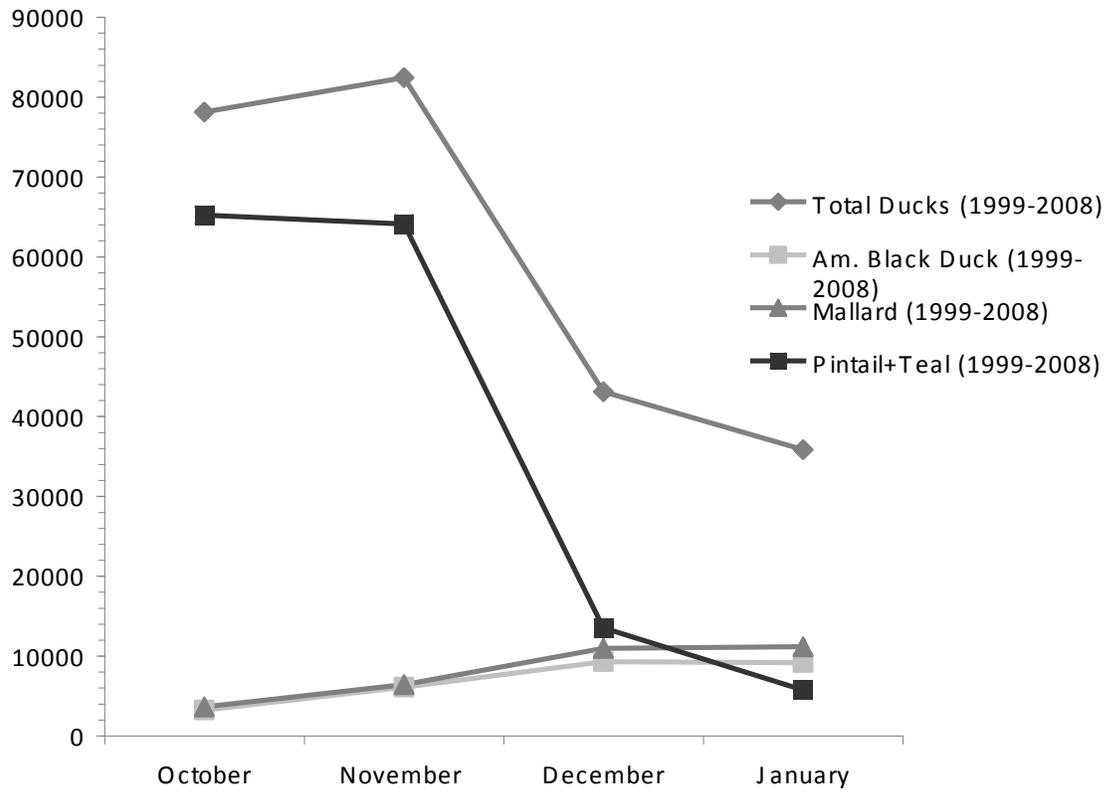


Figure 5. Short-term (1999-2008) trend data for the most abundant duck species observed in Delaware, as well as, the total number of ducks counted during each monthly survey.

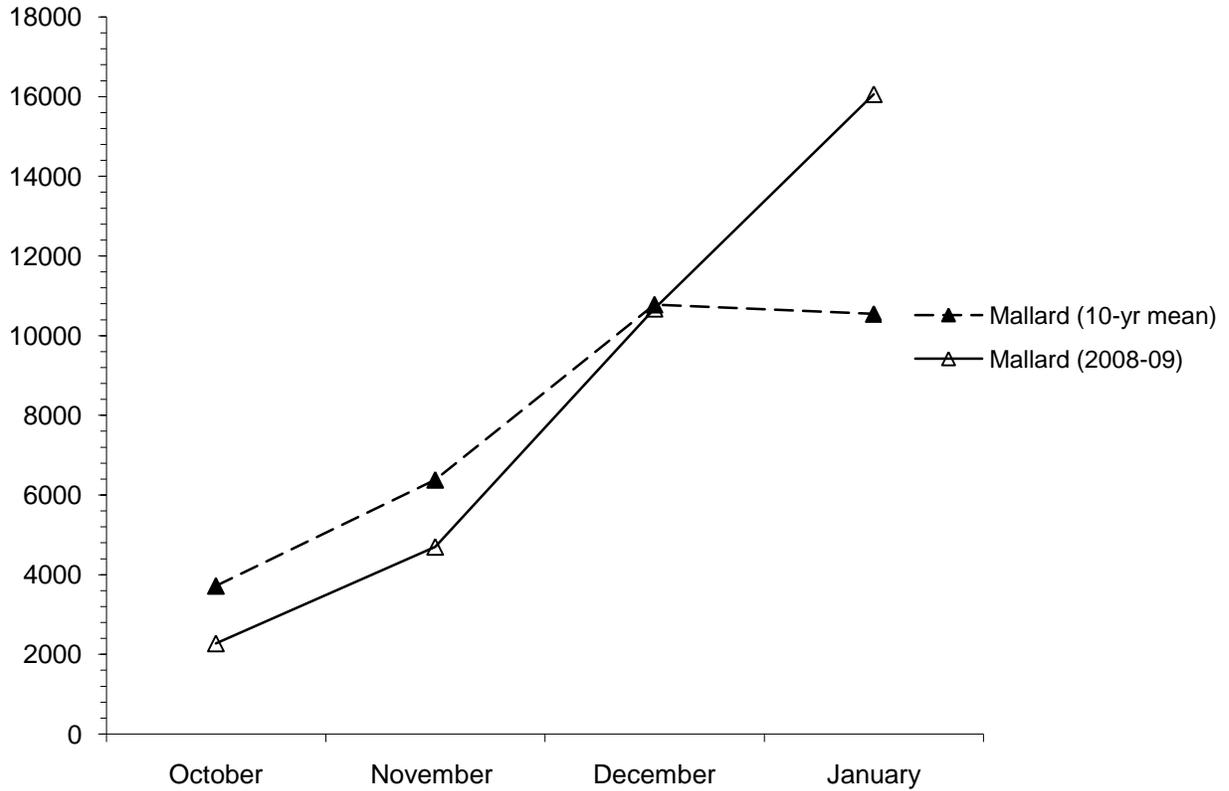


Figure 6. Number of mallards observed during the 2008-09 survey period compared to mean number observed during the previous ten years (1998-2007) in Delaware.

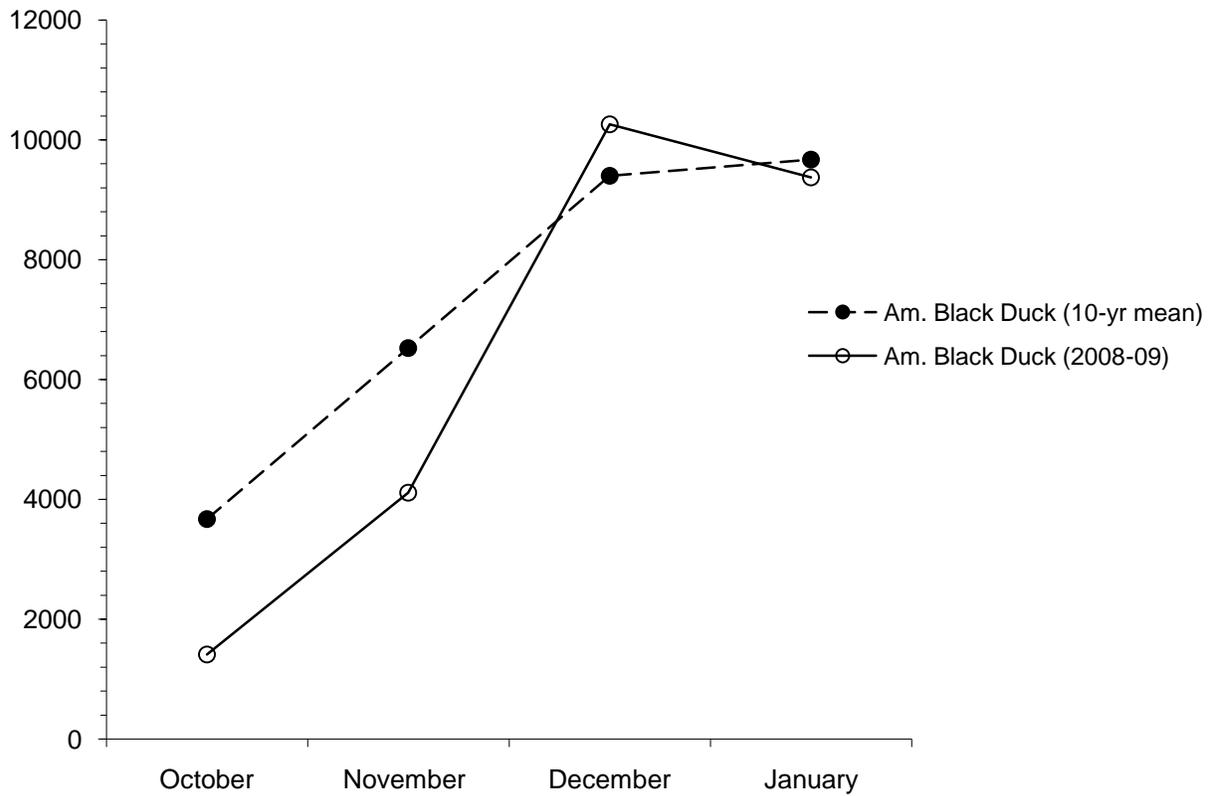


Figure 7. Number of American black ducks observed during the 2008-09 survey period compared to mean number observed during the previous ten years (1998-2007) in Delaware.

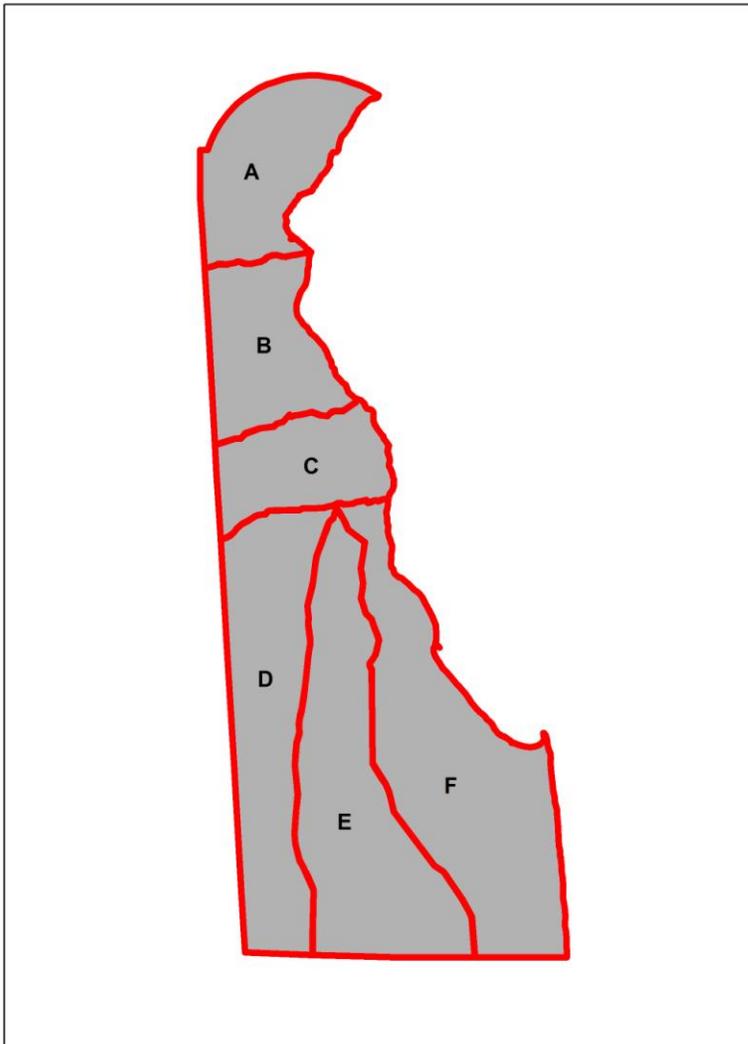


Figure 1. Canada Goose Survey Zones

- A. New Castle Co. North of the C&D Canal.
- B. New Castle Co. from the C&D Canal south to Smyrna.
- C. Kent Co. From Smyrna south to Dover.
- D. Kent and Sussex Co. south of Dover and west of Rt. 13.
- E. Kent and Sussex Co. south of Dover between Rt. 13 and Rt. 113.
- F. Kent and Sussex Co. south of Dover and east of Rt. 113

Table 1. The estimated resident Canada goose population in Delaware (2000-2009) with estimates of the Special September Canada goose season harvests and overall goose harvests during the same period.

Unit	2000 <sup>a,b</sup>	2001 <sup>c</sup>	2002	2003 <sup>d</sup>	2004	2005 <sup>e</sup>	2006	2007	2008	2009
A	971 (2,233) <sup>f</sup>	873 (1746)	507 (1014)	499 (998)	423 (846)	883 (1,766)	817 (1,634)	403 (806)	309 (618)	364 (728)
B	294 (676)	394 (788)	465 (930)	435 (870)	575 (1,150)	264 (528)	445 (890)	528 (1,056)	601 (1,202)	1,951 (3,902)
C	369 (849)	384 (768)	610 (1,220)	483 (966)	773 (1,546)	368 (736)	501 (1,002)	285 (570)	546 (1,092)	645 (1,290)
D	116 (267)	442 (884)	846 (1,692)	675 (1,350)	378 (756)	618 (1,236)	603 (1,206)	582 (1,164)	432 (864)	612 (1,224)
E	208 (478)	711 (1,422)	1020 (2,040)	732 (1,474)	478 (956)	549 (1,098)	978 (1,956)	525 (1,050)	864 (1,728)	814 (1,628)
F	481 (1,106)	1,404 (2,808)	1,227 (2,454)	1,143 (2,286)	1,254 (2,308)	1,831 (3,662)	1,620 (3,240)	1,480 (2,960)	2,093 (4,186)	2,902 (5,804)
Total	2,434 (5,610)	4,202 (8,416)	4,675 (9,350)	3,967 (7,934)	3,881 (7,762)	4,513 (9,026)	4,964 (9,928)	3,803 (7,606)	4,845 (9,690)	7,288 (14,576)
%Δ		+50%	+11%	-15%	-2%	+16%	+10%	-23%	+34%	+50%
Harvest (Sep)	700	5,900	6,300	2,900	3,300	2,000	1,100	2,100	2,200	
Harvest (All)	700	14,800	21,600	11,700	14,000	19,000	12,800	21,996	28,637	

<sup>a</sup> Corrected totals were expanded by 15% to reflect a 15% annual growth rate as identified in the Atlantic Flyway Resident goose management plan (2000 data only).

<sup>b</sup> Regular Canada goose season closed from 1995-2000.

<sup>c</sup> Regular Canada goose season reopened.

<sup>d</sup> Daily bag limit on Special September Canada goose season increased from 5 to 8 geese/day.

<sup>e</sup> Daily bag limit on Special September Canada goose season increased from 8 to 15 geese/day.

<sup>f</sup> Observed goose estimates were expanded by 2X to correct for lack of visibility due to vegetative cover.

**STATE: DELAWARE****GRANT NUMBER AND TITLE:**

W-37R - Wildlife Investigations - Waterfowl

**OBJECTIVE:**

To maintain waterfowl populations at sustainable and socially acceptable levels while maximizing recreational use of the resource.

**JOB NUMBER AND TITLE:**

Job 2. Waterfowl Population Breeding Index

**JOB OBJECTIVE:**

To derive a breeding pair index for nesting waterfowl in Delaware that can be combined with other Atlantic Flyway states to develop an estimate of Atlantic Flyway duck populations. This is being done in cooperation with the Atlantic Flyway Council.

**ACTIVITY:**

Twenty-nine randomly selected 1 km<sup>2</sup> plots were checked for waterfowl pairs between April 28 and May 3, 2009. Data for Canada geese, black ducks, mallards, wood ducks and other species were recorded and sent to the project coordinator at Patuxent Wildlife Research Center in Laurel, Maryland for inclusion in the annual Flyway report.

**TARGET DATE:**

September 30, 2008 - Note: per U.S Fish and Wildlife Service approval this target date has been extended to June 30, 2010.

**STATUS:**

On schedule - per approved extension.

**REMARKS:**

Aerial inventories were flown on April 28 and April 30 and ground searches of plots were completed on May 2 and 3. Birds observed on the plots included 7 pairs of mallards, 8 pairs of black ducks, 5 pairs of wood ducks, 8 pair of American green-winged teal, and 19 pairs of Canada geese.

**RECOMMENDATIONS:**

This job should be continued as it is being done in cooperation with and at the request of the USFWS and the AFCTS.

**PREPARED BY:**

Matthew DiBona  
Wildlife Biologist

**REVIEWED BY:**

Rob Hossler  
Program Manager – Game Species

**STATE:** Delaware

**GRANT NUMBER AND TITLE:**

W37-R Wildlife Investigations - Waterfowl

**JOB NUMBER AND TITLE:**

Job 3. Evaluation of Waterfowl Hunting Success on Public Hunting Areas.

**JOB OBJECTIVE:**

To determine waterfowl hunter effort/success and harvest composition at Augustine, Rocks, Cedar Swamp, Woodland Beach, Little Creek, Prime Hook, and Assawoman Wildlife Areas.

**ACTIVITY:**

No Activity

**TARGET DATE:**

September 30, 2009

**STATUS:**

Discontinued

**REMARKS:**

None

**RECOMMENDATIONS:**

This job should be discontinued until permit card accuracy can be verified through bag checks and spy blind activity.

**PREPARED BY:**

Matthew DiBona  
Gamebird Biologist

**STATE:** Delaware

**GRANT NUMBER AND TITLE:**

W37-R Wildlife Investigations - Waterfowl

**JOB NUMBER AND TITLE:**

Job 4. Waterfowl Habitat Use and Migration Patterns

**JOB OBJECTIVE:**

To collaborate with Ducks Unlimited, Inc. on a satellite radio telemetry research study examining the local and continental habitat use patterns of American black ducks during their annual life cycle and to derive potential linkages among wintering, migration (spring and fall) and breeding locations.

**ACTIVITY:**

In February 2009, five adult hen black ducks were captured at Prime Hook National Wildlife Refuge (n=4) and Fresh Pond State Park (n=1), outfitted with satellite transmitters, and released by Division and Ducks Unlimited staff. The Delaware Division of Fish and Wildlife contributed funding to Ducks Unlimited to purchase the 5, Model PPT-100 Solar Argos/GPS satellite transmitters and pay for data acquisition costs associated with these transmitters through 31 May 2010.

**TARGET DATE:**

September 30, 2010

**STATUS:**

On schedule – pre approved extension.

**REMARKS:**

In February 2009 five adult hen black ducks were captured at Prime Hook National Wildlife Refuge and nearby Salt Pond as part of our Avian Influenza Surveillance Program. Each hen was outfitted with Model PPT-100 Solar Argos/GPS satellite transmitters and released after being held overnight for observation.

At total of 7,578 GPS fixes and 3,306 Argos locations were collected during from February to December 2009. Preliminary data indicate birds captured in Delaware departed the wintering grounds between 31 March and 13 May 2009. Delaware birds averaged 4.2 stopovers during the spring migration with each stopover lasting an average of 4.66 days. All five birds settled into nesting areas in Canada: one in Labrador, one in New Brunswick, two in Quebec, and one in Ontario (Fig. 1). All five birds reached the breeding grounds between 26 April and 31 May. The “Ontario duck” followed the Hudson River Valley north to the St. Lawrence River before circling east to Maine and then intersecting its original trajectory heading westward. This

black duck departed Delaware on 1 May, took seven stopovers of no more than 4 days, and arrived on an inferred nesting area in eastern Ontario 15 May. Two PPT black ducks captured in Delaware completed a fall migration and returned to the same wetland at Prime Hook NWR (one was later harvested over a nearby agricultural field). The two marked birds that returned followed wholly different trajectories, with one having a stopover near Lake Ontario and the other having a two-week stopover at Wye Island Wildlife Management Area in Maryland, located on the east side of the Chesapeake Bay (Figure 2). Black ducks departed nesting areas between 5 October – 1 December ( $\bar{x}$  = 26 October) and arrived at wintering areas from 18 November – 18 December ( $\bar{x}$  = 29 November).

Ducks Unlimited is continuing analysis on the Delaware birds as well as birds from several other states. The anticipated date for completion of all data analysis is Spring 2011. At that time, Ducks Unlimited will provide the Division with copies of all the data and maps associated with the Delaware study birds as well as any associated reports.

**RECOMMENDATIONS:**

This job should be discontinued.

**PREPARED BY:**

Matthew DiBona  
Gamebird Biologist

**REVIEWED BY:**

Rob Hossler  
Program Manager – Game Species

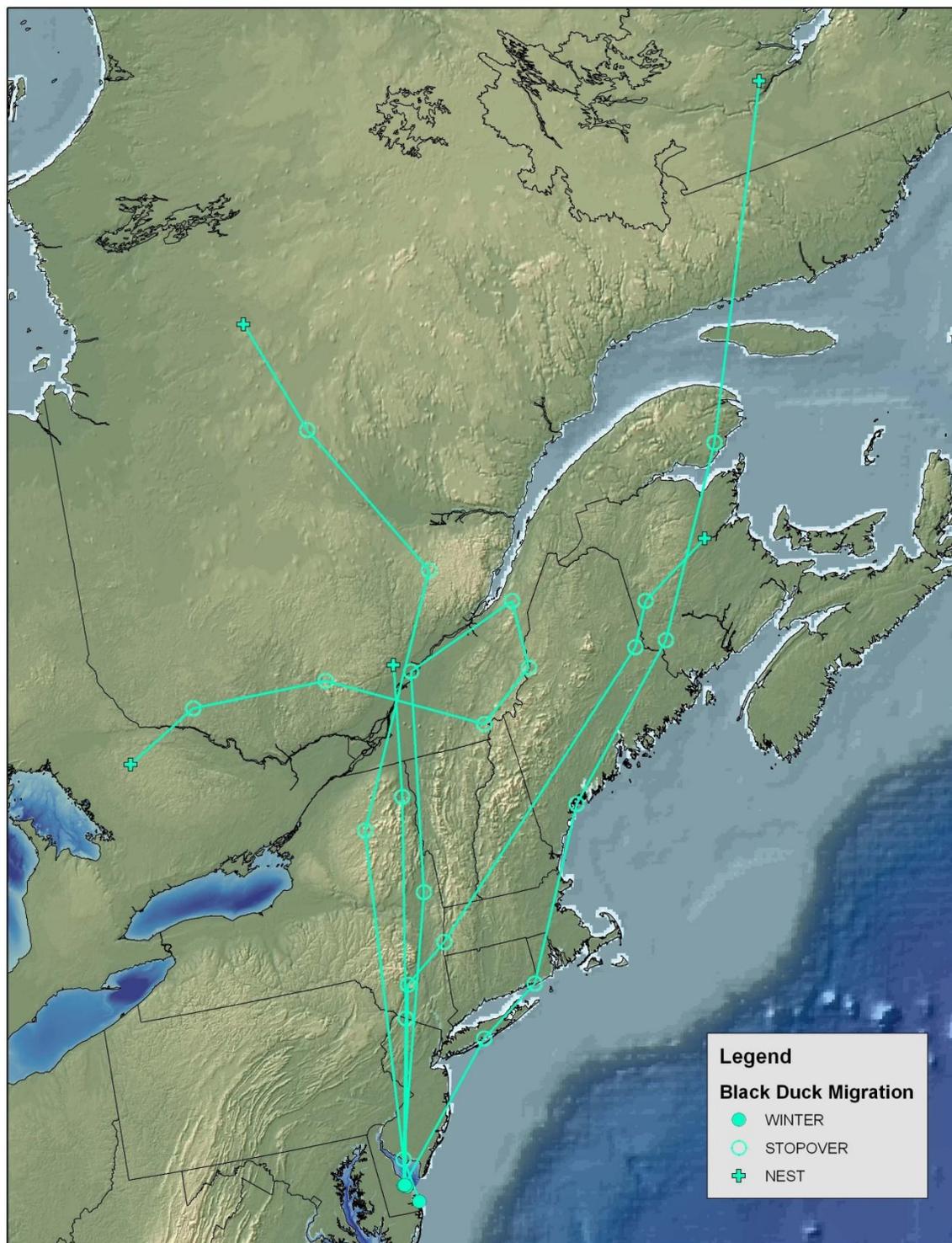


Figure 1. 2009 Spring migration routes of adult female American black ducks PTT-tagged in Delaware. Map courtesy of Kurt Anderson, Ducks Unlimited.

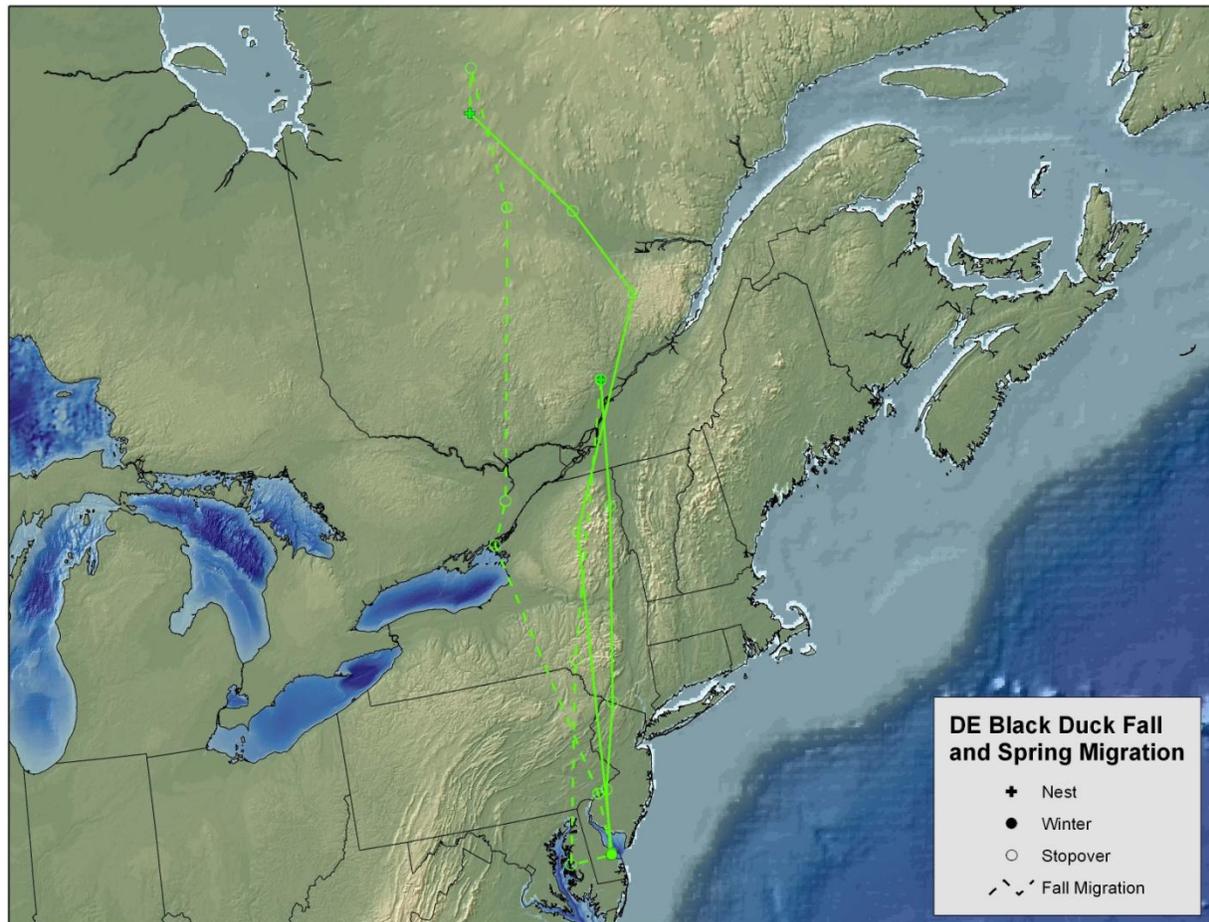


Figure 2. 2009 Fall and spring migration routes of adult female American black ducks PTT-tagged in Delaware. Map courtesy of Kurt Anderson, Ducks Unlimited.