

**PENNSYLVANIA GAME COMMISSION
BUREAU OF WILDLIFE MANAGEMENT
PROJECT ANNUAL JOB REPORT**

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TITLE: Waterfowl Research/Management

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TITLE: Waterfowl Banding

PERIOD COVERED: 1 July 2011 to 30 June 2012

COOPERATING AGENCIES: U.S. Fish & Wildlife Service; U.S. Geological Survey, Biological Resources Division, Bird Banding Laboratory; Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry and Bureau of State Parks

WORK LOCATION(S): Statewide

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ABSTRACT The objective of this project is to band representative samples of wild waterfowl as part of cooperative efforts by state, provincial, and federal agencies in the Atlantic Flyway that provide crucial data for management of the waterfowl resource. All work is permitted through the United States Geological Survey, Bird Banding Laboratory. During June 2011, 2,797 resident Canada geese (>100% of the state quota) were banded at 47 locations across 22 counties in Pennsylvania. Gosling production as measured by the statewide percentage (45%) of goslings banded per adult was the same as the 1988 to 2010 average. The use of multiple goose-banding crews has achieved aggregate banding quotas for all 6 individual physiographic strata for the period 2002 to 2011. During the August-September 2011 pre-season duck banding period, bandings occurred in 14 locations statewide with 5 of the 6 Pennsylvania Game Commission Regions participating. The 2,720 total new ducks banded were down 31% from the 1989 to 2010 average and 13% from 2010. Ducks banded included 2,000 mallards, 623 wood ducks, 15 American black ducks, and 82 individuals of 5 other species (blue-winged teal, green-winged teal, northern pintail, northern shoveler and hooded merganser, plus mallard x black duck hybrids). Atlantic Flyway banding quotas were met for mallards and juvenile male wood ducks, but missed for adult (51% attained) and juvenile female wood ducks (89% attained), and adult and juvenile black ducks (20% and 10% of respective quotas). The proportion of juvenile mallards in the banded sample was 21% below average, while wood duck production was 13% above average in 2011. The third year of the Black Duck Joint Venture winter banding initiative was successful in banding 278 black ducks, exceeding statewide numbers from the first 2 years of the initiative. Results to date indicate winter black duck banding will improve management for

this important species. Waterfowl banding should continue during 2012 in support of Atlantic Flyway banding program goals. We will continue efforts increase the geographic distribution of waterfowl bandings across the Commonwealth.

OBJECTIVE

To band representative samples of wild waterfowl as part of cooperative efforts by state, provincial, and federal agencies to achieve banding goals set in the Atlantic Flyway. This provides data (survival and harvest rates, migration timing, distribution and derivation, population changes, and production by local waterfowl) for waterfowl harvest management (e.g., Adaptive Harvest Management), habitat conservation programs (e.g., North American Waterfowl Management Plan), and other aspects for the stewardship of the waterfowl resource at state and flyway levels.

METHODS

During June 2011, resident Canada goose banding was conducted by Pennsylvania Game Commission (PGC) Bureau of Wildlife Management staff, regional personnel, and other volunteers that were organized into 3 banding crews (Northwest/Southwest, Southcentral, and Northeast/Southeast). The multi-crew approach is used to band a representative number of geese in the 6 physiographic strata (Fig. 1) in which banding quotas were set using 1% of the 2009-11 average breeding population estimates within each stratum. Flightless geese (goslings and molting adults) were captured by driving them onto land and surrounding them with a temporary corral of portable panels (Costanzo et al. 1995). Age and sex were determined for each goose using plumage characteristics and cloacal examination, respectively (Hanson 1962). Following determination of sex and age, geese were banded with standard Bird Banding Laboratory (BBL) butt-end aluminum leg bands.

Pre-season (August through September) duck banding was conducted by Bureau of Wildlife Management biologists and biologist aides, regional personnel (biologists, food & cover employees, and wildlife conservation officers), and banding volunteers at 14 sites in Erie, Crawford, Mercer, Somerset, Dauphin, York, Pike, Berks, and Lancaster counties. Ducks were captured in shallow-water swim-in traps baited with shelled corn. Age and sex of captured ducks were determined primarily from plumage characteristics (Bellrose 1976, Carney 1992), with cloacal examination (Dimmick and Pelton 1994) used to verify sex and age of individuals with questionable plumage. Following determination of sex and age, ducks were banded with standard BBL butt-end aluminum leg bands.

Winter banding targeted for American black ducks in coordination with the Black Duck Joint Venture (BDJV) was conducted 17 January through 16 March 2012 by Bureau of Wildlife Management staff, regional personnel, and biologist aides. Trapping locations included: (Northwest Region) Enterline Farm, Pymatuning Wildlife Management Area, Presque Isle State Park, (Southcentral Region) Haldeman Island, (Southeast Region) Middle Creek Wildlife Management Area and Lake Ontelaunee. Black ducks were captured by shallow swim-in traps baited with corn. Sex was determined by presence of mottling on the bill and confirmed by cloacal examination. Black ducks, mallards and hybrids were assigned to either “after second

year” (ASY) or “second year” (SY) based on the presence of edging and shape of the primary coverts 5-9, and the shape and wear of the tertial covert 5 (Ashley et al. 2006). Any ducks captured that were not conclusive were assigned to the age class “after hatch year” (AHY). We followed the BDJV classification protocol for hybrids based on wing characteristics and body plumage. Hybrids were categorized as “black duck like” (ABDX), intermediate (MBDX) and “mallard like” (MALX). Although mallards were not the targeted species, they were also banded, along with other species incidentally captured. Following species code, age, and sex determination, all ducks were banded with standard BBL butt-end aluminum leg bands and released.

Following trapping efforts, banding data was compiled using Bandit software (USGS-BRD Bird Banding Laboratory 2011). Electronic files of banding schedules were submitted to the BBL following the conclusion of field banding efforts.

RESULTS

Canada goose banding

Bureau of Wildlife Management staff, regional personnel, and volunteers were organized into banding crews operating in multiple regions (Regions 1-2, Region 4, Regions 5-6). No bandings were conducted in Region 3 in 2011 because the suite of counties due to be banded in stratum 242 were part of Regions 1 and 2 and reduced travel expenditures. The multi-crew approach is used to band a representative number of geese in the 6 physiographic strata in which banding goals are set using 1% of the 2009-11 average total spring population estimates for each stratum (Fig. 1). During June 2011, 2,797 resident Canada geese (109% of the state quota) were banded at 47 locations across 22 counties in Pennsylvania (Tables 1 and 2). The number of geese banded in 2011 was similar to 2010 and down 6% from the 2002-10 average of 2,988 reflecting the recent downward trend in Canada goose population estimates statewide. All stratum quotas were exceeded in 2011, ranging from 1% in stratum 243 to 26% in stratum 241. Since 2002, when we began using multiple-crews, aggregate 10-year banding accomplishments have exceeded the aggregate stratum quotas by 1% to 31%, and have exceeded the aggregate statewide quota by 16%. The multi-crew approach more effectively distributes the statewide banding sample than previously achieved using a single banding crew and allows managers to track populations and harvest rates through time at the stratum level.

Juvenile geese comprised 45% of the banded sample in 2011, the same as the 1988-2010 average. Statewide, the number of juveniles banded per new adult female banded (1.65) was the same as the 1988-2010 average, again indicating average gosling production and recruitment rates in 2011. Age ratios varied widely across strata from 0.73 in stratum 10 to 4.5 in stratum 241. There was no major weather event during nesting or brood rearing that readily accounts for the lower age ratio in stratum 10. Individual stratum age ratios can be an artifact of several banding locations that are molting areas with few, if any goslings. This occurred at 4 locations in stratum 10 in 2011. Statewide, we normally experience between 4 to 8 sites each year with no goslings present.

A total of 278 geese banded in previous years were recaptured during banding operations with 83% of these recaptures occurring in the same 10-minute block of latitude and longitude as

the original banding (Table 1). Forty-six recaptures were banded in a different 10-minute block than banded and are considered a foreign recapture. These recapture histories are provided in Table 3.

Pre-season duck banding

Pennsylvania's duck banding quotas as outlined in the North American Banding Program Document (U.S. Fish and Wildlife Service [USFWS] 1989) are 1,200 mallards (600 adult, 300 immature male and female each), 750 wood ducks (400 adult, 175 immature male and female each), and 100 black ducks (50 adult, 25 immature male and female each).

Habitat conditions during the pre-season banding period were generally drier than average for much of Pennsylvania in early August. However, two extreme flooding events occurred across central and eastern Pennsylvania from late August through the end of banding period and adversely impacted banding operations in the Southcentral, Northeast and Southeast regions.

Bandings occurred in 14 locations statewide with 5 of the 6 PGC Regions participating. The 2,720 total new ducks banded were down 31% from the 1989 to 2010 Long Term Average (LTA) and 13% from 2010 (Tables 4 and 5). Atlantic Flyway banding quotas were met for mallards and juvenile male wood ducks, but missed for adult (51% attained) and juvenile female wood ducks (89% attained), and adult and juvenile black ducks (20% and 10% of respective quotas).

As usual, mallards made up the largest species proportion of the total with 2,000 individuals banded (Table 4), down 26% from the LTA. The 2011 mallard juvenile to adult age ratio of 1.67 was 21% below the LTA of 2.11. Mallard age ratios, since 1989, have ranged from 1.4 to 3.23 juveniles per adult. Wood duck bandings were down 41% from the LTA with 623 banded this year. The wood duck age ratio of 2.04 juveniles per adult was 13% above the average of 1.8 (range 1.17 to 2.76). Only 15 American black ducks were banded which is down 75% from average. Pre-season black duck bandings continue to fall short of flyway quotas and well below average levels. The PGC was again awarded a grant from the BDJV Northeast States Black Duck Banding Project Fund for banding efforts for black ducks in Pennsylvania. These grant monies are directed towards winter black duck banding efforts.

From 1989-2010 Pymatuning Wildlife Management Area (WMA) accounted for 73% of the total statewide duck bandings each year. In 2011, the ducks banded at Pymatuning accounted for 58% of the total Pennsylvania duck bandings. Numbers of mallards and wood ducks banded at Pymatuning has declined since 2002 despite efforts to capture ducks in new areas. Pymatuning remains the top banding location for mallards in the Commonwealth with 70% of the statewide total. Wood duck bandings at Pymatuning accounted for 17.7% of the state total. Presque Isle (Erie County) accounted for 15.8% of the total duck bandings in 2011 and was similar to the LTA for this location. Presque Isle accounted for 16.6% of state mallard bandings and 13.5% of state wood duck bandings. Two banding locations in Mercer County accounted for 3.3% and 3.7% of statewide mallard and wood duck bandings respectively and produced 4 black duck bandings (27% of state total). Middle Creek WMA accounted for 14% of total statewide duck bandings. The Middle Creek total was below the LTA for this location. Middle Creek was the

third highest producer of mallards and first in wood duck bandings in the state with 8.5% and 33% of the respective totals for each species. Haldeman Island (Dauphin County) accounted for 4% of the statewide banding total in 2011. This was below the LTA for this banding station. Bandings of wood ducks accounted for 16% of the state totals. The 4 Northeast Region banding locations collectively accounted for 2.5% of all duck bandings and 9.6% of all wood duck bandings. Black ducks banded (1) was below the LTA for this historically important black duck breeding area and reflects the continued poor breeding population status of this species in Pennsylvania.

Important numbers of pre-season ducks were obtained from the remaining 4 banding locations in Somerset (4.3% of state wood duck bandings), York and Berks counties. One important component of pre-season duck banding is to mark representative proportions of our statewide waterfowl population as financially and logistically feasible. Therefore, we strive to maintain and increase our efforts where possible throughout the commonwealth. This reduces potential bias in estimated population parameters (i.e. survival and harvest rates) that would otherwise occur from banding at relatively few locations. We will continue efforts to support and maintain operational banding stations in PGC regions with relatively few waterfowl bandings compared with the rest of Pennsylvania.

Because dabbling duck species other than mallards, black ducks, and wood ducks breed only in limited numbers in Pennsylvania or their forage preference is not provided in traps (i.e. mergansers), bandings of these species can include a higher percentage of migrants relative to locally breeding or produced birds, and thus tend to be more variable from year to year due to the effects of weather conditions and food availability on migration patterns. An additional 82 individual blue-winged teal, green-winged teal, northern shoveler, northern pintail, MBDH, and hooded merganser were banded in 2011 (Table 5).

Since 1996, the transition to toll-free (TF) bands (inscribed with the toll-free telephone number 1-800-327-BAND, for reporting band recoveries), and now, including a web-address (www.reportband.gov) in addition to the TF inscription, has been effective at increasing band-reporting rates. Higher reporting rates improve the cost-effectiveness of banding efforts by increasing the amount of information gained per unit effort expended in banding operations. A necessary drawback to this program has been a period of time during which reporting rates were changing and uncertain, temporarily precluding direct estimation of harvest rates. With the TF and web inscriptions now fully implemented, reporting rates are believed to have stabilized. Continental reassessment of reporting rates occurred from 2002 to 2010 to ensure that harvest rates are being accurately estimated from band returns. The USFWS initiated research on current band reporting rates (i.e., a reward-banding study) for mallards and black ducks in 2002. Wood ducks, some Canada goose populations, and other species were added to the study for 2003-2004 to address the possibility of different reporting rates for species other than mallards. In 2011, the federal band reporting rate study was suspended due to budget constraints.

Results from this study indicated that Atlantic Flyway reporting rates are approximately 73% for mallards, wood ducks, and resident Canada geese. There is some evidence that Canadian reporting rates (58%) are lower than the U.S. reporting rates and may explain why reporting rates for American black duck and migratory Canada geese are somewhat lower than

the species mentioned previously. These reporting rates compare with approximately 30 to 40 percent before the use of the TF/web reporting system.

Winter American Black Duck banding

The winter of 2012 marked the third of a 5-year BDJV coordinated banding study. Trapping and banding work was conducted by trained PGC staff. Initial training sessions for winter banding personnel were conducted in January and August 2010. Agency staff also attended training at the 2011 Atlantic Flyway waterfowl wing-bee and January 2012 BDJV training in New Jersey. Training has included proper identification of mallard x black duck hybrids, age classification, use of rocket and cannon nets, efficient trapping methods to increase capture rates and improved welfare of trapped ducks. Training certifications obtained include North American Banding Council waterfowl trainer level and USFWS use of explosives for wildlife capture.

A total of 278 black ducks were banded (NW-3, SC-0, SE-275) (Table 6) exceeding 2011 by 25% and 2010 by 38%. However, statewide banding distribution goals (150 Northwest, 50 Southeast) were missed in the Northwest Region (2% attained) but were exceeded (5.5 times goal) for Southeast Pennsylvania. Considerable effort was expended to capture ducks in the Northwest Region; however, the birds only used baited sites during below average temperatures with snow and ice cover, which occurred very infrequently. There were in excess of 500 birds on bait when conditions were favorable, but rapid melt of snow and ice immediately following trap placement resulted in birds abandoning the sites. Of the 278 black ducks banded, 199 were males (72%) and 79 (28%) were females. The proportion of males and females observed in 2012 was similar to 2010 and 2011 post season banding. The age ratio of SY to ASY Black ducks was 1.38, similar to 2011 (1.27) but substantially higher than the age ratio observed in 2010 (0.67). We also banded 25 hybrids (33% less than 2011) including 23 ABDX, 1 MALX and 1 MBDX. The additional training and classification system has greatly improved bander identification and proper classification of trapped birds; a few birds that may have been previously classified as MBDH in prior years, were now classified as American Black Duck due to the allowance of some "buff or gray" in the greater secondary coverts.

Although mallards were not the targeted species, 285 were banded during this period or 17% fewer than in 2011. As outlined by the operating protocols for winter banding operations, a continental total > 3,000 post season mallards was determined to be adequate to allow statistical assessment of vital rates similar to black ducks. Of the mallards banded, 185 were males (65%) and 100 were females (35%). The proportion of males and females differed from 2011 (55% males and 45% females), a result of banding females over males in 2011 for more efficient use of band inventories. The 2012 sex ratio was similar to 2010. The age ratio of SY to ASY mallards observed this year (1.4) was higher than age ratios observed in 2010 (0.97) and 2011 (0.95). Both mallard and black duck winter age ratios were lower than the observed preseason age ratios in Pennsylvania (mallard average 2.16 - 6.74, black duck 1.73-30.25). This is expected since the annual survival of juvenile birds is lower than adults; observed age ratios should decrease as the season progresses. In addition to black ducks, mallards and hybrids, 5 additional species were banded including: American green-winged teal (20), American wigeon (12), ring-necked duck (2), northern pintail (1) and wood duck (1).

Middle Creek WMA accounted for the largest proportion of black ducks (63%) banded, 26% of mallards, and 68% of hybrids. Lake Ontelaunee in Berks County accounted for the largest proportion of mallards (70%) banded, as well as 36% of black ducks and 32% of hybrids. The success at these two sites carried this project for Pennsylvania in 2012. In northwest Pennsylvania, Pymatuning WMA accounted for 3% of mallards while Shenango WMA in Mercer County accounted for 1% of black ducks and 1% of mallards and the other species banded besides the 2 ring-necked ducks at Middle Creek. The post-season black duck banding pilot study will continue through 2014.

RECOMMENDATIONS

1. Continue waterfowl banding efforts during Fiscal Year 2012 in support of the Atlantic Flyway cooperative banding program. Continue efforts to distribute Canada goose bandings proportionally in each physiographic stratum, to increase the number of black ducks banded, and to improve the geographic distribution of mallard and wood duck bandings.

2. Participate as needed with the BBL, USFWS and Atlantic Flyway Migratory Game Bird Technical Section band reporting rate studies, reassessment of banding needs, bander training and other banding related activities affecting populations of waterfowl important to Pennsylvania.

3. Continue using Bandit software with updates to manage banding database. Continue to support agency banding staff on electronic entry and submission of banding data for the 2012 field season.

4. Acquire and distribute bands and equipment to field biologists in advance of all waterfowl banding programs.

5. Conduct post-season winter duck banding in support of the pilot black duck banding study and seek financial support from the Northeast U.S. BDJV grant.

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Table 1. Numbers of resident Canada geese, by age and sex category, banded in Pennsylvania during 2011, plus recaptures of previously banded geese.

Location name or nearest town	Code	Adult		Juvenile		New Total	Recaptures			Total
		Male	Female	Male	Female		Local	Foreign	Total	
<u>Stratum 10 (Stratum goal = 740)</u>										
Lennon & Neff Farms near Ortanna	ADAM02	27	17	22	16	82	3	6	9	91
Near Martin Farm E of Gettysburg	ADAM04	5	7	7	6	25	2	0	2	27
1 mile E of Bendersville	ADAM06	11	10	20	22	63	0	0	0	63
3 miles W of East Berlin	ADAM07	7	7	10	8	32	0	0	0	32
8.5 miles N of Reading	BERK03	112	122	1	0	235	6	4	10	245
Kaercher Creek Park	BERK05	15	12	3	3	33	2	0	2	35
Blue Marsh Lake	BERK08	22	13	9	2	46	6	0	6	52
Near Camp Hill	CUMB02	13	14	6	20	53	0	0	0	53
1 mile WSW of Williams Grove	CUMB07	13	13	0	0	26	0	0	0	26
Near Hershey	DAUP02	29	26	0	0	55	1	0	1	56
Middle Creek WMA	LANC01	27	28	22	33	110	36	0	36	146
1.5 miles south of Pennsburg	MTGM01	16	9	0	0	25	1	3	4	29
Deep Creek Reservoir	MTGM05	20	21	3	5	49	0	0	0	49
Totals (113% of goal)		317	299	103	115	834	57	13	70	904
<u>Stratum 13 (Stratum goal = 320)</u>										
1 mile S of Pleasantville	BEDF03	13	16	14	23	66	16	2	18	84
Near Hamburg	BEDF05	32	19	14	20	85	0	0	0	85
Near Cessna	BEDFWAM	3	2	12	8	25	2	1	3	28
Near Martinsburg	BLAIR01	19	15	3	6	43	6	0	6	49
4.5 miles S of Shickshinny	LUZE02	6	12	9	13	40	0	1	1	41
4 miles NE of Drums	LUZE07	5	5	10	11	31	0	1	1	32
Near Auburn	SCHUY04	20	15	0	0	35	9	0	9	44
2 miles NE of Pine Grove	SCHUY05	3	4	3	4	14	2	0	2	16
Totals (106% of goal)		101	88	65	85	339	35	5	40	379
<u>Stratum 22 (Stratum goal = 397)</u>										
3 miles NE of Elderton	ARMS05	1	1	5	3	10	1	0	1	11
2 miles N of Prospect	BUTL04	53	52	9	16	130	3	8	11	141
Near Evans City	BUTL05	28	33	41	48	150	11	2	13	163
Near Cooperstown	BUTL08	17	13	8	14	52	3	0	3	55
Near Shelocta	INDI03	10	10	19	29	68	0	0	0	68
Totals (103% of goal)		109	109	82	110	410	18	10	28	438

Table 1. cont.

Location name or nearest town	Code	Adult		Juvenile		New Total	Recaptures			Total
		Male	Female	Male	Female		Local	Foreign	Total	
<u>Stratum 241 (Stratum goal = 405)</u>										
Pymatuning WMA	CRAW01	49	48	111	120	328	70	3	73	401
Presque Isle State Park	ERIE01	0	2	0	0	2	1	1	2	4
Near Sharon	MERC02	11	9	26	17	63	1	0	1	64
Near Valcourt	MERC04	11	4	7	4	26	3	0	3	29
4 miles SE of Mercer	MERC10	15	14	29	33	91	0	5	5	96
Totals (126% of goal)		86	77	173	174	510	75	9	84	594
<u>Stratum 242 (Stratum goal = 373)</u>										
5 miles NW of Worthington	ARMS02	17	19	11	6	53	9	0	9	62
Near East Brady	ARMS07	30	33	20	31	114	13	2	15	129
Near Parker	ARMS08	9	4	1	2	16	1	3	4	20
1 mile SE of Moniteau	BUTL01	10	18	42	25	95	2	1	3	98
Near Knox	CLAR03	22	22	18	14	76	0	0	0	76
10 miles SE of Indiana	INDI01	4	3	8	11	26	2	0	2	28
Totals (102% of goal)		92	99	100	89	380	27	6	33	413
<u>Stratum 243 (Stratum goal = 321)</u>										
2 miles NW of Tompkinsville	LACKA01	6	5	8	14	33	2	0	2	35
Near Duryea	LUZE05	1	2	6	7	16	0	0	0	16
Near Tobyhanna	MONR01	19	14	1	2	36	0	1	1	37
6 miles SE of Greentown	PIKE05	5	10	2	2	19	4	0	4	23
1 mile SW of Lakeville	WAYN01	0	0	3	5	8	5	0	5	13
1 mile W of Sterling	WAYN03	8	14	10	12	44	2	1	3	47
Near Lake Ariel	WAYN05	12	6	15	20	53	3	1	4	57
Near Honesdale	WAYN07	9	12	11	0	32	4	0	4	36
Wilkes Barre	WIBA01	7	3	5	2	17	0	0	0	17
1 mile S of Center Moreland	WYOM03	18	18	14	16	66	0	0	0	66
Totals (101% of goal)		85	84	75	80	324	20	3	23	347
Grand Total		790	756	598	653	2797	232	46	278	3075

Table 2. 2011 Canada goose bandings and recaptures by PGC region and county.

Region	County	Total New Bandings	Total Recaptures
NW	Crawford	328	73
	Mercer	180	9
	Butler	427	30
	Clarion	76	0
	Erie	2	2
	NW Region Total	1013	114
SW	Armstrong	193	29
	Indiana	94	2
	SW Region Total	287	31
SC	Adams	202	11
	Bedford	176	21
	Blair	43	6
	Cumberland	79	0
	SC Region Total	500	38
NE	Lackawanna	33	2
	Luzerne	104	2
	Monroe	36	1
	Pike	19	4
	Wayne	137	16
	Wyoming	66	0
	NE Region Total	395	25
SE	Berks	314	18
	Dauphin	55	1
	Lancaster	110	36
	Montgomery	74	4
	Schuylkill	49	11
	SE Region Total	602	70

Table 3. Banding histories of Canada geese recaptured during 2011 banding and previously banded in another location.

Recapture Location	Original Banding Location	Banding Date	Number of Birds
Pymatuning WMA	Ontario Canada	1998	1
Pymatuning WMA	Ohio	2009	1
Presque Isle	Ohio	2010	1
SGL 95 near Moniteau	Findley Lake NY	2008	1
Near Tobyhanna	Monroe County	1996	1
Pymatuning WMA	Woodcock Creek Lake	2010	1
SE of Mercer	Lake Latonka	2008	5
East Brady	Alleg. River Armstrong Co.	2008	2
Parker	Near Emlenton	2008	3
Moraine State Park	Unknown	Unknown	1
Moraine State Park	Ohio	2010	1
Moraine State Park	SGL 95 Near Moniteau	2005	4
Moraine State Park	Near Sharon	2010	1
Moraine State Park	Near Meridian	2003	1
Vicnor Near Evans City	Unknown	Unknown	1
Vicnor Near Evans City	Ontario Canada	2006	1
8.5 miles NE of Reading	Blue Marsh Lake	2007	2
8.5 miles NE of Reading	Near Pine Grove	2008	1
Near Sterling	Near Tobyhanna	2009	1
Near Lake Ariel	N of Lakeville	2009	1
W. of Pottstown	Deep Creek Reservoir	2006	2
Near Drums	Wyoming County	2005	1
Near Shickshinny	New York	2008	1
N of Reading	Quebec	2008	1
Near Cessna, Bedford Co.	Near Martinsburg, Blair Co.	2009	1
S of Pleasantville	Near Howard, Centre Co.	2009	1
Near Cashtown, Adams Co.	Near Scotland, Franklin Co.	2010	4
S of Pleasantville	Virginia	2003	1
Near Cashtown, Adams Co.	Connecticut	2006	1
Near Cashtown, Adams Co.	Unknown	Unknown	1
S of Pennsburg, Montgomery Co.	New York	2008	1

Table 4. Numbers of mallards, wood ducks and American black ducks banded in Pennsylvania during the 2011 pre-season banding period.

Banding Location	Mallard					Wood Duck					Black Duck					Total
	AM ^a	AF	JM	JF	Total	AM	AF	JM	JF	Total	AM	AF	JM	JF	Total	
<i>NW Region</i>																
Pymatuning WMA	335	206	450	401	1,392	22	6	47	35	110	1	3	1	1	6	1,508
Presque Isle	61	21	151	98	331	19	3	41	21	84	0	0	1	1	2	417
Mercer Co. – Pine Run	0	0	0	0	0	7	1	7	4	19	0	0	0	0	0	19
Mercer Co – Shenango	11	5	33	18	67	0	3	1	0	4	4	0	0	0	4	75
<i>SW Region</i>																
Mallards Rest – Boswell	0	0	0	0	0	3	6	14	4	27	0	0	0	0	0	27
<i>SC Region</i>																
Haldeman Island	2	2	5	1	10	8	12	45	33	98	0	0	0	0	0	108
Lake Marburg – York Co.	0	0	0	0	0	0	0	6	6	12	0	0	0	0	0	12
Hoke Mill – York Co.	0	0	9	4	13	0	0	0	0	0	0	0	0	0	0	13
<i>NE Region</i>																
Shohola Lake, SGL 180	0	1	2	2	5	10	5	25	11	51	0	0	0	0	0	56
Pecks Pond	0	0	0	0	0	0	0	6	3	9	0	0	0	0	0	9
Decker Pond, SGL 183	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Promised Land State Park	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
<i>SE Region</i>																
Middle Creek WMA	48	51	42 ^c	29	170	23	75	70	39 ^d	207	2	0	0	0	2	379
Lake Ontelaunee	3	3	0	5	11	1	1	0	0	2	0	0	0	0	0	13
Statewide Total	460	290	692	558	2,000	93	112	262	156	623	7	3	2	3	15	2,638
PA quota ^b	600 ad.	300	300	300	1,200	400 ad.	175	175	175	750	50 ad.	25	25	100		

^a AM – adult male, AF = adult female, JM = juvenile male, JF = juvenile female.

^b Set by Atlantic Flyway banding needs document.

^c Includes 1 local male mallard.

^d Includes 1 local female wood duck.

Table 5. Numbers of other ducks banded in Pennsylvania during the 2011 pre-season banding period.

Banding Location	Species								Total
	BWTE ^a	AGWT	NSHO	NOPI	HOME	MALL X ABDU HYBRIDS			
						MALX	MBDX	ABDX	
<i>NW Region</i>									
Pymatuning WMA	24	25	0	3	1	5	3	1	62
Presque Isle	13	1	0	0	0	0	0	0	14
<i>SC Region</i>									
Haldeman Island	0	0	4	0	0	0	0	0	4
<i>SE Region</i>									
Middle Creek WMA	0	0	0	0	0	0	0	1	1
Statewide Total	37	26	4	3	1	5	3	2	81

^a BWTE – blue-winged teal, AGWT – American green-winged teal, NSHO – Northern shoveler, NOPI- Northern pintail, HOME – hooded merganser, MALX – mallard appearing mallard x black duck hybrid, MBDX – intermediate appearing mallard x black duck hybrid, ABDX – black duck appearing mallard x black duck hybrid.

Table 6: Number of ducks banded in Pennsylvania during the 2012 winter black duck banding.

Banding Location	Black Duck							Black Duck Like Hybrid							Mallard						
	ABDU							ABDX							MALL						
	ASY M ^a	ASY F	SY M	SY F	AHY M	AHY F	Total	ASY M	ASY F	SY M	SY F	AHY M	AHY F	Total	ASY M	ASY F	SY M	SY F	AHY M	AHY F	Total
NW Region																					
Pymatuning WMA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	5	0	0	9
Shenango WMA	2	0	0	1	0	0	3	0	0	0	0	0	0	0	2	0	1	0	0	0	3
SE Region																					
Middle Creek WMA	52	9	71	43	0	0	175	7	1	5	3	0	0	16	14	8	23	27	0	1	73
Lake Ontelaunee	48	6	26	20	0	0	100	4	1	2	0	0	0	7	74	18	68	40	0	0	200
Total	102	15	97	64	0	0	278	11	2	7	3	0	0	23	92	27	93	72	0	1	285

^a ASYM = after second year male, ASYF = after second year female, SYM = second year male, SYF = second year female, AHYM = after hatch year male, AHYF = after hatch year female.

Table 6 Continued: Number of ducks banded in Pennsylvania during the 2012 winter black duck banding.

Banding Location	Intermediate							Mallard like Hybrid						
	MBDX							MALX						
	ASYM ^a	ASYF	SYM	SYF	AHYM	AHYF	Total	ASYM	ASYF	SYM	SYF	AHYM	AHYF	Total
SE Region														
Middle Creek WMA	0	0	1	0	0	0	1	0	0	0	0	0	0	0
Lake Ontelaunee	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	0	0	1	0	0	0	1	1	0	0	0	0	0	1

^a ASYM = after second year male, ASYF = after second year female, SYM = second year male, SYF = second year female, AHYM = after hatch year male, AHYF = after hatch year female.

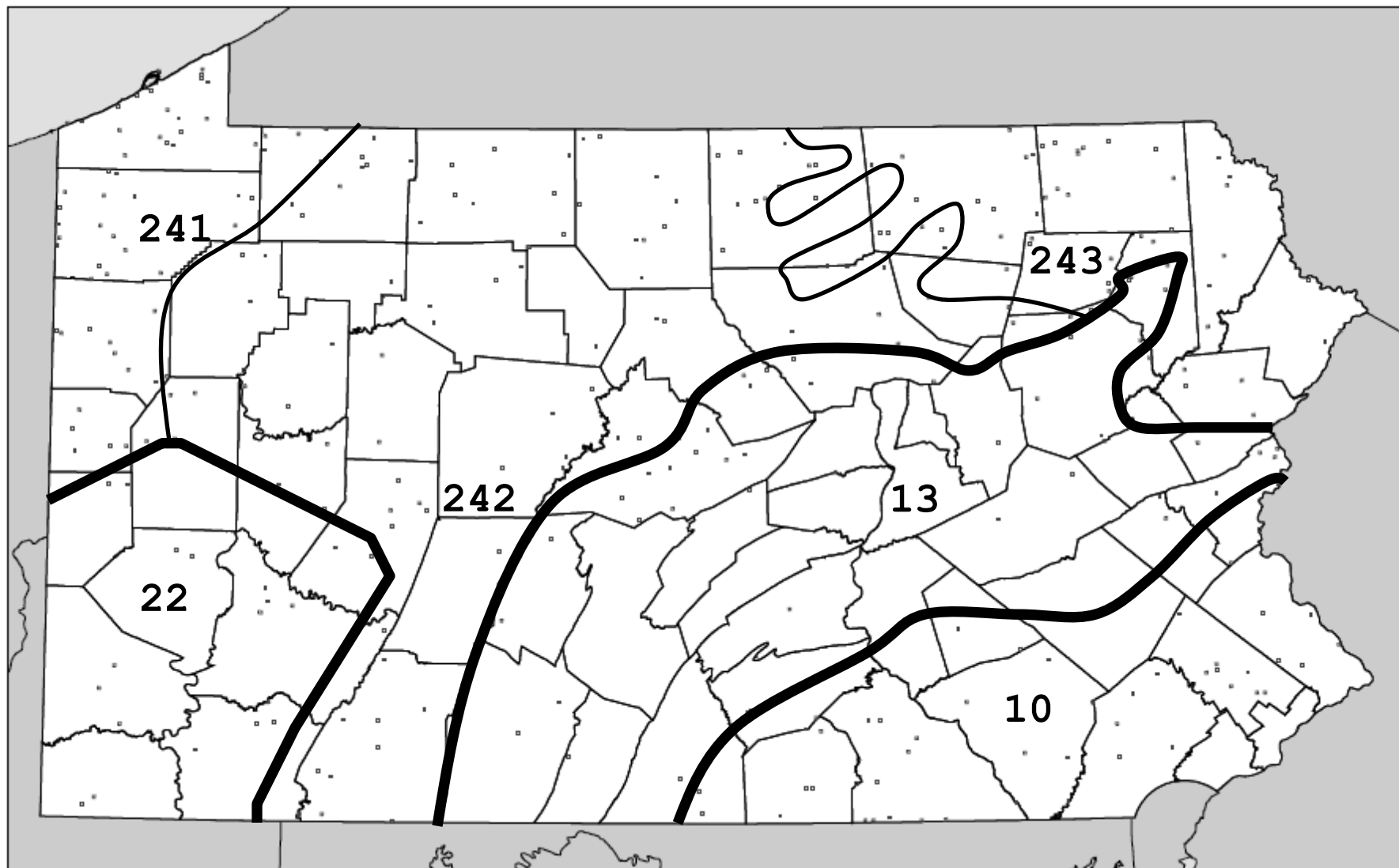


Figure 1. Location of Atlantic Flyway breeding waterfowl survey plots within major physiographic provinces in Pennsylvania. Physiographic Provinces are Piedmont (10), Ridge and Valley (13), Pittsburgh Plateau (22), Glaciated NW (241), Allegheny Mountain/Plateau (242), and Pocono/Low Plateau (243).