

**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 2015 to 30 June 2016

COOPERATING AGENCIES: U.S. Fish and 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

PREPARED BY: Kevin Jacobs and Jeremy Stempka

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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 2015, 2,868 resident Canada geese (>100% of the state quota) were banded at 37 locations across 17 counties in Pennsylvania. Gosling production as measured by the statewide percentage (40%) of goslings in the banded sample was 9% below the 1988 to 2014 average. The use of multiple goose-banding crews has achieved aggregate banding quotas for all 6 individual physiographic strata for the period 2002 to 2015. However, in 2015 only 3 of 6 physiographic strata quotas were met. During the August-September 2015 pre-season duck banding period, bandings occurred in 16 locations statewide with 5 of 6 Pennsylvania Game Commission Regions participating. The 3,606 total new ducks banded were down 5% from the 1989 to 2014 average and down 16% from 2014. Ducks banded included 2,040 mallards, 1,470 wood ducks, 18 American black ducks, and 78 individuals of 4 other species (blue-winged teal, green-winged teal, northern pintail, northern shoveler), plus mallard x black duck hybrids. Atlantic Flyway banding quotas were met for mallards and wood ducks, but were missed for adult and juvenile black ducks (20% and 16% of respective quotas obtained). The proportion of juvenile mallards and wood ducks to adult mallards and wood ducks in the banded sample was 5% above and 6% below average respectively. The seventh year of the Black Duck Joint Venture winter banding initiative was successful in banding 168 black ducks, equal to 2010, which was the fewest black ducks banded during the 7 year project. Results to date indicate winter black duck banding will improve management for this important species.

Waterfowl banding should continue 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.

METHODS

During June 2015, resident Canada goose banding was conducted by Pennsylvania Game Commission (PGC) Bureau of Wildlife Management staff, region personnel, and other volunteers that were organized into 3 banding crews (Northwest/Southwest/Northcentral, 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 2013-15 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 2015) duck banding was conducted by Bureau of Wildlife Management biologists and biologist aides, region personnel (biologists, food and cover employees, and wildlife conservation officers), and banding volunteers at 16 sites in Erie, Crawford, Somerset, Dauphin, Pike, Monroe, Bradford, Luzerne, Berks, and Lancaster counties (Figs. 2, 3 and 4). 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.

In 2010, the Black Duck Joint Venture (BDJV) initiated a 5-year pilot study to determine the feasibility of banding wintering black ducks in the northeastern states to estimate seasonal survival. During this time period, wintering populations of black ducks are more abundant and concentrated than in the preseason. Black duck banding distribution goals for Pennsylvania were 150 black ducks in the Northwest Region (to target the Great Lakes) and 50 black ducks for the rest of Pennsylvania, although we continued efforts through the end of the banding period (20 March) rather than cease efforts when goals were reached. This project has continued beyond the pilot study on a year-by-year basis as results and management applications are analyzed. These analyses and discussions at the flyway and joint venture levels will determine whether winter black duck banding becomes a long-term operational program.

The 2016 winter black duck trapping and banding work was conducted by trained PGC staff. Banding locations included in the Northwest Region: Enterline Farm, Presque Isle State Park,

and Shenango River; in the Northcentral Region: Spring Creek, near Spring Mills, and near Boalsburg; in the Southcentral Region: Haldeman Island; in the Northeast Region: Near Almedia; and in the Southeast Region: Middle Creek Wildlife Management Area (WMA). Trapping was conducted from 20 January through 20 March 2016. Black ducks were captured using shallow swim in traps baited with shelled corn. Species, age and gender identification followed the techniques outlined in the BDJV booklet (Black Duck Joint Venture 2012).

Field banding data was compiled and entered into Excel by PGC staff. Data was then proofed and imported into Bandit software. Electronic data of new banding records was electronically submitted to the U.S. Geological Survey BBL via Bandit. All recaptures were entered into Bandit to check recapture histories and then submitted to the BBL via reportband.gov.

RESULTS

Bureau of Wildlife Management, Region personnel and volunteers were organized into banding crews operating in multiple regions (Regions 1-2-3, Region 4, and Regions 5-6). The multi-crew approach is used to band a representative number of geese in the 6 physiographic strata (Fig. 1) in which banding goals are set using 1% of the 2013-15 average total spring population estimates for each stratum. During June 2015, 2,868 Canada geese were banded at 37 locations across 17 counties in Pennsylvania (Table 1). The geese banded in 2015 were similar to that banded in 2014 and 12% more than the state goal of 2,567. In stratum 10, 241, and 243 quotas were exceeded by 36%, 28%, and 27% respectively. However, in stratum 13, 22, and 242 quotas were missed by 9%, 11% and 1% respectively. Since 2002, when we began using multiple-crews, aggregate 10-year banding accomplishments have exceeded the aggregate stratum quotas by 1% to 36%, and have exceeded the aggregate statewide quota by 17%. The multi-crew approach has greatly improved the distribution of the statewide banding sample than previously achieved using a single banding crew.

Juvenile (includes both “local” or unfledged and “hatch year” or fledged) geese comprised 40% of the total banded sample in 2015, down 9% from the 1988-2014 average of 44%, indicating average or slightly below average gosling recruitment this spring. In addition, the statewide age ratio of 1.30 juveniles per new adult female banded was 19% below the 1988-2014 average of 1.61, again indicating slightly below average gosling recruitment. It should be noted these indices are relatively crude measures of gosling productivity. However by using consistent banding methods over the past 25 years it can provide a useful index through time. As expected, age ratios of juveniles to new adult females varied across strata from 0.39 in stratum 22 to 3.0 in stratum 13. Annual age ratios at the stratum level can be influenced by banding locations that are primarily molting areas or have egg and nest control programs that result in few goslings present. For example, Ethel Springs Lake in strata 22 had 272 new adults and only 10 new goslings banded. This is consistent with prior years banding at this location and it is likely an area where adults molt rather than breed and does not necessarily indicate poor production.

A total of 310 geese banded in previous years were recaptured during banding operations with 92% of these recaptures occurring in the same 10-minute block of latitude and longitude as the original banding. Twenty-six recaptures were banded in a different 10-minute block than they were originally banded and are considered a foreign recapture. Of these, 2 were originally banded

outside of Pennsylvania (Table 2).

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).

Bandings occurred in 16 locations statewide with 5 of 6 PGC Regions participating (Fig. 2). The 3,606 total new ducks banded were down 5% from the 1989 to 2014 Long Term Average (LTA) of 3,787 and down 16% from 2014 totals (Tables 3 and 4). Atlantic Flyway banding quotas were met for mallards and wood ducks, but missed for adult and juvenile black ducks (20% and 16% of respective quotas obtained).

As usual, mallards made up the largest species proportion of the total with 2,040 individuals banded (Table 3), 21% below the LTA of 2,573. The 2015 mallard juvenile to adult age ratio of 2.26 was 5% above the LTA of 2.16. Mallard age ratios, since 1989, have ranged from 1.4 to 3.23 juveniles per adult. Wood duck accounted for the next most numerous species banded with 1,470 individuals banded, 45% above the LTA of 1,017. The wood duck age ratio of 1.79 juveniles per adult was 6% below the LTA of 1.9 (range 1.17 to 2.76). Only 18 American black ducks were banded which is down 67% from LTA of 55. Pre-season black duck bandings continue to fall short of flyway quotas and well below average. 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 1989-2014 Pymatuning WMA averaged 57% of the total statewide duck bandings each year. In 2015, the ducks banded at Pymatuning accounted for 54% 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 66% of the statewide total. Wood duck bandings at Pymatuning accounted for 37% of the state total. Presque Isle (Erie County) accounted for 20% of the total duck bandings in 2015 and was double the LTA of 10% for this location. Presque Isle accounted for 25% of state mallard bandings and 13% of state wood duck bandings.

In the Southeast Region most of the trapping and banding is conducted by regional wildlife personnel at the Middle Creek WMA in Lancaster and Lebanon counties. In addition, another strong and very successful effort was put into trapping and banding ducks at Lake Ontelaunee in Berks County. A total of 131 ducks were banded at Lake Ontelaunee, up 85% compared to the LTA of 71 ducks. Overall, Lake Ontelaunee accounted for 4% of the total ducks banded statewide. Middle Creek WMA accounted for 7% of total statewide duck bandings, 42% below the LTA of 12% for this location.

Haldeman Island (Southcentral Region) accounted for 6% of the statewide banding total in 2015 and bandings of wood ducks accounted for 13% of the state totals. The 8 Northeast Region banding locations collectively accounted for 5% of all duck bandings and 11% of all wood duck bandings. The 3 Southwest Region banding locations collectively accounted for 4% of all duck

bandings and 8% of all wood duck bandings.

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.

Over the years mallards and wood ducks generally account for over 95% of the ducks banded. This year, mallards and wood ducks accounted for 3,510 total banded birds or 97% of the total ducks banded. In addition, we banded 96 (3%) other ducks including: 42 blue-winged teal, 18 American black ducks, 11 northern shovelers, 8 green-winged teal, 8 northern pintails, 6 mallard dominant hybrids, 2 black duck dominant hybrids, and 1 mallard x black duck hybrids (Table 4).

Winter American Black Duck banding

Since 2010, 1,832 American black ducks have been banded during the post season black duck banding (Table 5). Of those, there have been 152 hunting-related recoveries of Pennsylvania banded birds reported through January 2015 (includes both direct and indirect recoveries) (Table 6). Pennsylvania accounted for the majority of the recoveries (45%), while Ohio, New York, Quebec, North Carolina, Maryland, Delaware, and Virginia accounted for an additional 45% of the recoveries.

In 2016, 168 black ducks were banded (Northwest-88, Northcentral-11, Northeast-15, Southeast-54). This is tied for the fewest black ducks banded statewide since the beginning of the black duck banding project in 2010. The reduced success reflects a combination of mild weather conditions, and reduced banding effort (number of personnel and amount of overtime) due to agency budget constraints. Unseasonably warm weather provided open water and available food resources leaving trapping conditions very difficult. Winter banding success relies on extreme cold temperature which freezes wetlands, limits food availability and concentrates ducks allowing for easier access and trapping. During mild winters, such as in 2016, optimal trapping conditions usually exist in short periods followed by warm temperatures and melting ice. It is important to take advantage of these opportunities. However, with the reduction of personnel and elimination of weekend banding it was very difficult to maximize these opportunities.

Of the 168 black ducks banded, 96 were males (57%) and 72 (43%) were females (Table 7). The age ratio of second year (SY) to after second year (ASY) black ducks was 1.43. We also banded 27 hybrids including 21 American Black Duck Dominant Mallard Hybrid (ABDX), 2 Mallard Dominant American Black Duck Hybrid (MALX) and 4 Mallard American Black Duck Intermediate (MBDX). Although mallards were not the targeted species, 440 were captured and banded during trapping operations. Of the 440 mallards banded, 265 were males (60%) and 175 were females (40%) which was identical proportions compared to 2015. The age ratios of SY to ASY mallards was 1.47. Both mallard and black duck winter age ratios were lower than the

observed preseason age ratios in Pennsylvania (mallard average 2.17, black duck average 2.06). However, since the annual survival of juvenile birds is lower than adults, observed age ratios should decrease as the season progresses. 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.

In addition to black ducks, mallards and hybrids, 4 additional species were banded including: wood duck (20), redhead (7), gadwall (1), and northern pintail (1).

In the Southeast Region, Middle Creek WMA accounted for 32% of black ducks and 1.6% of mallards. In the Southcentral Region, Haldeman Island accounted for 1% of mallards. In the Northeast Region, the site near Almedia accounted for 9% of black ducks and 1% of mallards. In the Northwest Region, the banding sites at Enterline Farm in Mercer County accounted for 17% of black ducks and 60% of mallards while Presque Isle in Erie County accounted for 35% of black ducks and 29% of mallards. In the Northcentral Region, the Centre County sites accounted for 7% of black ducks and 7% of the mallards. Considerable effort was expended to capture ducks across these 5 regions of Pennsylvania. Field staff are benefitting from experience and training obtained through the first 6 years of the project. Focusing efforts during below average temperatures with snow and ice cover has resulted in greater capture rates.

RECOMMENDATIONS

1. Continue waterfowl banding efforts during Fiscal Year 2016 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 banding needs assessment, 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 2016 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.

LITERATURE CITED

Bellrose, F. C. 1976. Ducks, geese, and swans of North America. Stackpole Books, Harrisburg, Pennsylvania, USA.

- Black Duck Joint Venture. 2012. American black duck winter banding program: species identification and aging based on wing plumage. Black Duck Joint Venture, Laurel, Maryland, USA.
- Carney, S. M. 1992. Species, age, and sex identification of ducks using wing plumage. U.S. Fish and Wildlife Service, Washington, D.C., USA.
- Costanzo, G. R., R. A. Williamson, and D. E. Hayes. 1995. An efficient method for capturing flightless geese. *Wildlife Society Bulletin* 23:201-203.
- Dimmick, R. W., and M. R. Pelton. 1994. Criteria of sex and age. Pages 169-214 *in* T. A. Bookhout, editor. *Research and management techniques for wildlife and habitats*. Fifth edition. The Wildlife Society, Bethesda, Maryland, USA.
- Hanson, H. C. 1962. Characters of age, sex, and sexual maturity in Canada geese. *Illinois Natural History Survey Biological Notes* 49. Urbana, USA.
- U.S. Fish and Wildlife Service. 1989. The North American duck banding program - A revised approach. Technical report, U.S. Department of Interior, Washington, D.C., USA.

Table 1. Numbers of resident Canada geese, by age and sex category, banded in Pennsylvania during 2015, plus recaptures of previously banded geese.

Stratum	Region	Location	Name	Adult		Adult Total	Local		Local Total	Grand Total	Recaptures			Total Birds
				Female	Male		Female	Male			Foreign	Local	Total	
10	SC ^a	FRAN02	Near Mont Alto	8	7	15	37	22	59	74	0	7	7	81
		FRAN04	Near Fayetteville	31	36	67	37	30	67	134	0	16	16	150
	SC ^a Total			39	43	82	74	52	126	208	0	23	23	231
	SE ^a	CHES02	Near Kennett Square	35	28	63	0	0	0	63	0	4	4	67
		CHES04	Near Nottingham	5	11	16	0	0	0	16	0	2	2	18
		CHES07	Somerset Lake	20	12	32	0	0	0	32	0	0	0	32
		CHES08	Near West Chester	18	11	29	0	0	0	29	0	4	4	33
		LANC01	Middle Creek WMA	112	82	194	55	37	92	286	0	34	34	320
		LANC04	Near Mount Joy	38	43	81	35	28	63	144	0	13	13	157
		SE ^a Total			228	187	415	90	65	155	570	0	57	57
10 Total				267	230	497	164	117	281	778	0	80	80	858
13	NC ^a	CENTR02	Bald Eagle SP	2	6	8	0	0	0	8	0	1	1	9
		LYCO02	Near Montgomery	9	4	13	21	18	39	52	0	0	0	52
	NC ^a Total			11	10	21	21	18	39	60	0	1	1	61
	SC ^a	MIFF01	Kish Park	15	12	27	21	26	47	74	1	0	1	75
		MIFF02	Krentzman Property	14	16	30	25	13	38	68	0	0	0	68
	SC ^a Total			29	28	57	46	39	85	142	1	0	1	143
	NE ^a	CARB01	Beltzville Lake	19	26	45	30	19	49	94	2	19	21	115
		CARB03	Near Weatherly	5	4	9	11	8	19	28	1	0	1	29
	NE ^a Total			24	30	54	41	27	68	122	3	19	22	144
13 Total				64	68	132	108	84	192	324	4	20	24	348
22	SW ^a	ALLE03	Restlawn Cemetary	40	34	74	11	5	16	90	0	27	27	117
		WEST03	Near Mammoth	4	7	11	10	11	21	32	2	0	2	34
		WEST05	Ethel Springs Lake	145	127	272	7	3	10	282	4	18	22	304
		WEST07	Near Mt. Pleasant	3	3	6	8	6	14	20	0	0	0	20
		WEST11	Lower Twin Lakes Park	8	5	13	9	7	16	29	0	4	4	33
	SW ^a Total			200	176	376	45	32	77	453	6	49	55	508
22 Total				200	176	376	45	32	77	453	6	49	55	508
241	NW ^a	CRAW01	Pymatuning WMA	16	20	36	95	86	181	217	0	61	61	278
		ERIE01	Presque Isle SP + WGG Cemetery	83	95	178	46	41	87	265	1	0	1	266
		ERIE02	Near Sigel Marsh SGL 218	2	3	5	16	14	30	35	0	1	1	36
	NW ^a Total			101	118	219	157	141	298	517	1	62	63	580
241 Total				101	118	219	157	141	298	517	1	62	63	580

Table 1 cont.

Stratum	Region	Location	Name	Adult		Adult Total	Local		Local Total	Grand Total	Recaptures			Total Birds
				Female	Male		Female	Male			Foreign	Local	Total	
242	NC ^a	CLEAR01	Near Penfield	26	27	53	0	0	0	53	3	0	3	56
		CLEAR02	Dubois Reservoir	2	1	3	6	4	10	13	0	5	5	18
		CLEAR10	Near Dubois	3	5	8	10	14	24	32	0	5	5	37
	NC ^a Total			31	33	64	16	18	34	98	3	10	13	111
NW		CLAR01	Near Leeper	2	1	3	8	3	11	14	2	0	2	16
		FORE01	Buzzard Swamp	57	62	119	18	17	35	154	1	30	31	185
		FORE02	Near Tionesta	7	9	16	11	15	26	42	0	1	1	43
		WARR04	Near Tidioute	23	20	43	29	22	51	94	1	0	1	95
	NW ^a Total			89	92	181	66	57	123	304	4	31	35	339
SW ^a	WEST08		Near Donegal	7	4	11	15	10	25	36	5	4	9	45
				7	4	11	15	10	25	36	5	4	9	45
	SW ^a Total			7	4	11	15	10	25	36	5	4	9	45
242 Total				127	129	256	97	85	182	438	12	45	57	495
243	NE ^a	MONR01	Near Tobyhanna	9	8	17	1	1	2	19	0	0	0	19
		MONR03	Near Shawnee	7	13	20	11	13	24	44	0	4	4	48
		MONR09	Near Tannersville	16	19	35	15	7	22	57	1	0	1	58
		WAYNE01	Near Lakeville	1	0	1	4	0	4	5	0	0	0	5
		WAYNE02	Duck Harbor Pond	67	71	138	10	9	19	157	1	15	16	173
		WAYNE04	Near Cold Springs	3	2	5	8	16	24	29	1	1	2	31
		WAYNE06	Paupackan Lake	15	14	29	16	2	18	47	0	8	8	55
	NE ^a Total			118	127	245	65	48	113	358	3	28	31	389
243 Total				118	127	245	65	48	113	358	3	28	31	389
2015 Pennsylvania Grand Total				877	848	1725	636	507	1143	2868	26	284	310	3178

^a SC=Southcentral, SE=Southeast, NC=Northcentral, NE=Northeast, SW=Southwest, NW=Northwest,

Table 2. Banding histories of Canada geese recaptured during 2015 banding and previously banded in another location.

Recapture Location	Original Banding Location	Banding Date	Number of Birds
Near Leeper	Near Penfield	2012	1
Near Leeper	Buzzard Swamp	2009	1
Near Penfield	Dubois Reservoir	2012	1
Near Penfield	Virginia	2013	1
Near Penfield	Near Hollidaysburg	2014	1
Presque Isle SP	SGL 218	2009	1
Buzzard Swamp	Ontario Canada	2005	1
Near Tidioute	Chapman Dam SP	2010	1
Near Mammoth	Ethel Springs Lake	2009,2012	2
Ethel Springs Lake	Near Ligonier	2012	2
Ethel Springs Lake	Near Blairsville	2014	1
Ethel Springs Lake	Near Somerset	2014	1
Near Donegal	Near Mt. Pleasant	2010	3
Near Donegal	Pioneer Park Campground	2008	1
Near Donegal	Green Lick	2010	1
Kish Park	Near Hopewell	2014	1
Near Weatherly	Beltzville Lake	2009	1
Beltzville Lake	Near Lehighton	2009	1
Beltzville Lake	Weir Lake	2012	1
Duck Harbor Pond	Near Long Pond	2014	1
Near Tannersville	3.5 miles north of Tannersville	2009	1
Near Cold Springs	Duck Harbor Pond	2009	1

Table 3. Numbers of mallards, wood ducks and American black ducks banded in Pennsylvania during the 2015 pre-season banding period.

<u>Location</u>	Mallard					Wood Duck					Black Duck				
	AHY M	AHY F	HY M	HY F	Total	AHY M	AHY F	JM	JF	Total	AHY M	AHY F	HYM	HYF	Total
<u>NE Region</u>															
Shohola Lake, SGL 180	0	0	1	0	1	4	5	16	12	37	0	0	0	0	0
Decker Pond, SGL 183	0	0	0	0	0	10	7	16	6	39	0	0	0	0	0
Pecks Pond	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Promised Land State Park	0	0	5	1	6	5	1	11	8	25	0	0	0	1	1
Long Pond, Monroe County	0	0	0	0	0	1	2	3	2	8	0	0	0	0	0
Bradford County	0	0	0	1	1	9	0	17	13	39	0	0	0	0	0
Luzerne County	0	0	0	0	0	4	2	3	9	18	0	0	0	0	0
Penn Forest Reservoir	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0
Total	340	286	777	635	2040^c	307	220	564	379	1470	9	1	2	6	18
Statewide Goal^b	600	AHY	300	300	1200	400	AHY	175	175	750	50	AHY	25	25	100

^a AHYM = after hatch year male, AHYF = after hatch year female, HYM = hatch year male, HYF = hatch year female, JM = juvenile male (HY and local), JF= juvenile female.

^b Includes 1 additional unknown age and unknown sex.

^c Includes 2 additional unknown age, unknown sex.

Table 4. Numbers of other ducks banded in Pennsylvania during the 2015 pre-season banding period.

Banding Location	Species Code ^a						Total	
	BWTE	AGWT	NOPI	NSHO	ABDX	MBDX		MALX
Northwest Region								
Pymatuning WMA ^b	29	6	6	11	0	0	3	55
Presque Isle	8	1	2	0	1	0	1	13
Southcentral Region								
Haldeman	2	1	0	0	0	0	0	3
Southeast Region								
Middle Creek WMA ^b	3	0	0	0	0	0	0	3
Lake Ontelaunee	0	0	0	0	1	1	2	4
Statewide Total	42	8	8	11	2	1	6	78

^a Species code: BWTE - blue-winged teal, AGWT - American green-winged teal, NOPI - Northern pintail, NSHO - Northern shoveler, ABDX - black duck like hybrid, MBDX - intermediate hybrid, MALX - mallard like hybrid

^b WMA-Wildlife Management Area

Table 5. Pennsylvania winter black duck bandings, 2010-2016.

Year	Black Ducks Banded
2010	168
2011	201
2012	278
2013	363
2014	271
2015	383
2016	168
7-Year Total	1,832

Table 6: Recovery distribution by state or province of hunter harvested Black Ducks banded post season from 2010 to 2015

State/Province Name	Birds Recovered (n=152)	Percentage
Pennsylvania	68	0.45
Ohio	18	0.12
New York	11	0.07
Quebec	11	0.07
Ontario	9	0.06
North Carolina	8	0.05
Maryland	5	0.03
Delaware	4	0.03
Virginia	3	0.02
New Jersey	2	0.01
South Carolina	2	0.01
Arkansas	2	0.01
Georgia	1	0.01
Kentucky	1	0.01
South Dakota	1	0.01
Indiana	1	0.01
Vermont	1	0.01
West Virginia	1	0.01
Michigan	1	0.01
Maine	1	0.01
Iowa	1	0.01

Table 7. Number of ducks banded in Pennsylvania during the 2016 winter black duck banding period.

Banding Location	Black Duck (ABDU)							Black Duck Like Hybrid (ABDX)							Mallard (MALL)								
	ASYM ^a	ASYF	SYM	SYF	AHYM	AHYF	Total	ASYM	ASYF	SYM	SYF	AHYM	AHYF	SY UNK	Total	ASYM	ASYF	SYM	SY F	AHYM	AHYF	Total	
NW Region																							
Presque Isle	11	4	15	29	0	0	59	3	3	1	1	0	0	0	8	36	24	35	34	0	0	129	
Enterline Farm	11	2	12	4	0	0	29	3	0	1	0	0	0	0	4	75	27	94	69	0	0	265	
NC Region																							
Spring Creek	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	7	2	6	10	0	0	25	
Near Boalsburg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Spring Mills	6	1	0	2	0	0	9	0	0	0	0	0	0	0	0	2	0	1	2	0	0	5	
NE Region																							
Near Almedia	4	2	6	3	0	0	15	0	0	1	0	0	0	0	1	0	0	3	2	0	0	5	
SC Region																							
Haldeman Island	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	4	
SE Region																							
Middle Creek WMA	18	10	13	13	0	0	54	3	1	2	2	0	0	0	8	3	1	0	3	0	0	7	
Total	50	19	46	53	0	0	168	9	4	5	3	0	0	0	21	123	54	140	121	2	0	440	

^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, SY UNK= Second year Unknown Sex.

Table 7 Continued. Number of intermediate hybrids and Mallard like hybrids banded in Pennsylvania during the 2016 winter black duck banding

Banding Location	Intermediate (MBDX)							Mallard Like Hybrid (MALX)						
	ASYM ^a	ASYF	SYM	SYF	AHYM	AHYF	Total	ASYM	ASYF	SYM	SYF	AHYM	AHYF	Total
NW Region														
Presque Isle	0	0	1	0	0	0	1	1	0	0	0	0	0	1
Enterline Farm	1	1	0	0	0	0	2	0	0	0	0	0	0	0
NC Region														
Spring Creek	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Near Boalsburg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spring Mills	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NE Region														
Near Almedia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SC Region														
Haldeman Island	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SE Region														
Middle Creek WMA	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Total	1	2	1	0	0	0	4	1	0	1	0	0	0	2

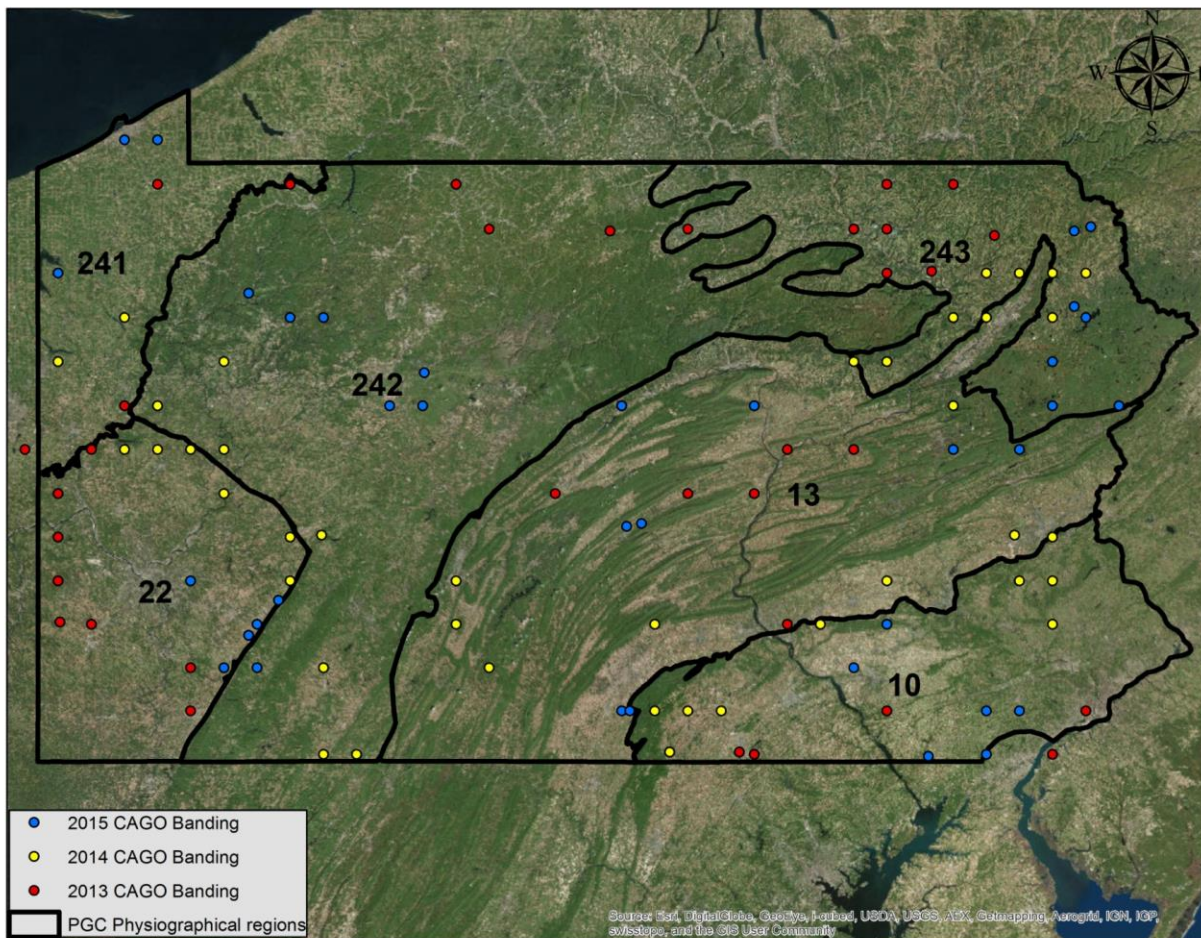


Figure 1. Goose banding locations (centers of 10-minute latitude-longitude blocks) from 2013-2015 within the major physiographic provinces in Pennsylvania. Physiographic Provinces are Piedmont (10), Ridge and Valley (13), Pittsburgh Plateau (22), Glaciated NW (241), Allegheny Mountain/Plateau (242), and Pocono/Low Plateau (243).

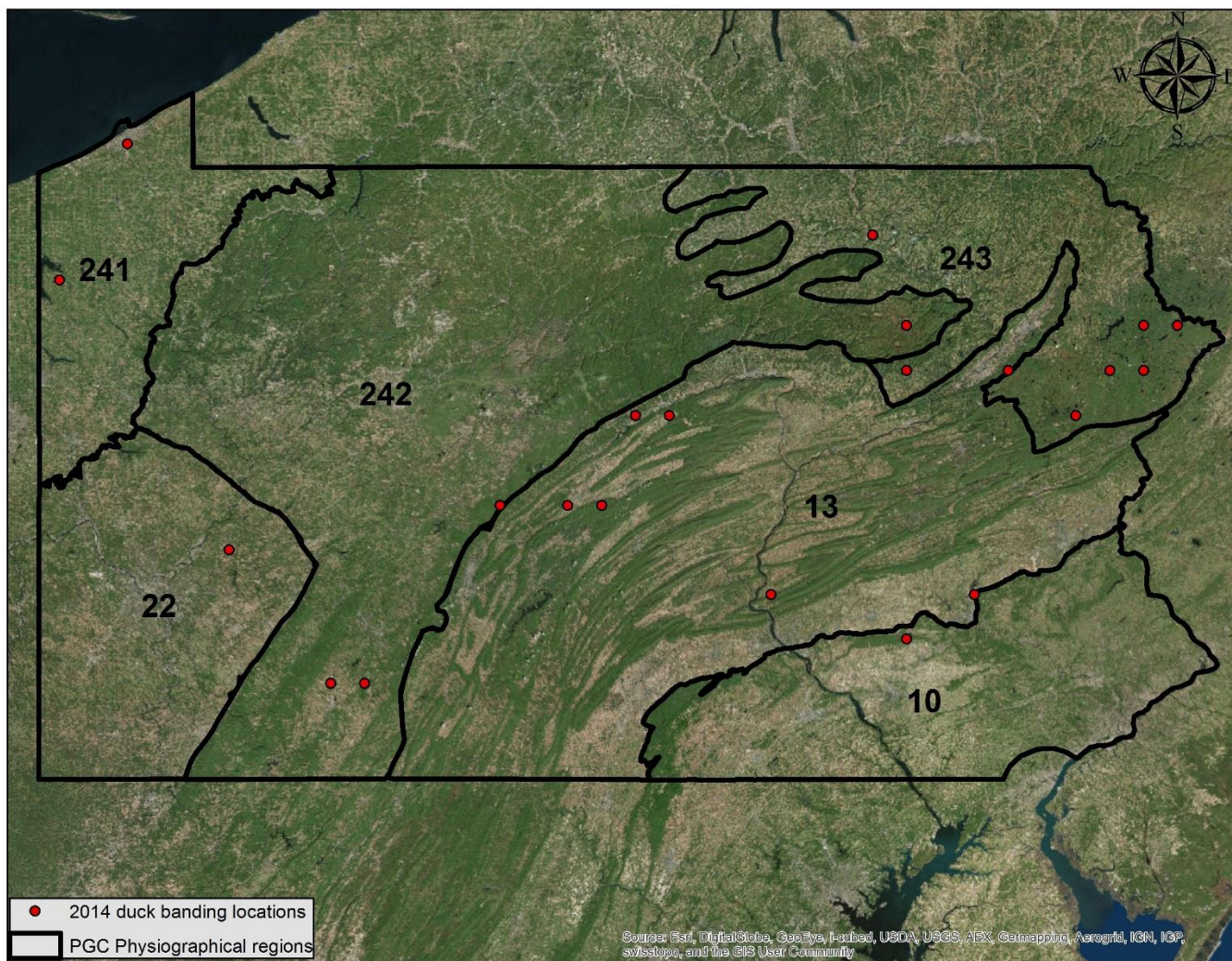


Figure 2. 2015 pre-season duck banding locations and the major physiographic provinces in Pennsylvania. Physiographic Provinces are Piedmont (10), Ridge and Valley (13), Pittsburgh Plateau (22), Glaciated NW (241), Allegheny Mountain/Plateau (242), and Pocono/Low Plateau (243).