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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 2008 to 30 June 2009

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 provides crucial data for management of the waterfowl resource. During June 2008, 3,108 resident Canada geese (>100% of the state quota) were banded at 38 locations across 21 counties in Pennsylvania. Gosling production was above the 1991 to 2007 average. The use of multiple goose-banding crews has achieved aggregate banding quotas for all 6 individual physiographic strata for the period 2002 to 2008. During the August-September 2008 preseason-banding period 3,618 ducks were banded including 2,364 mallards, 1,123 wood ducks, 27 American black ducks, and 104 individuals of 5 other species (blue-winged teal, green-winged teal, northern pintail, American wigeon and black-bellied whistling duck, plus mallard x black duck hybrids). Banding quotas were obtained for mallards and juvenile wood ducks, but not for adult wood ducks or black ducks. The proportion of juvenile mallards in the banded sample was above average, while wood duck production was average in 2008. Waterfowl banding should continue during 2009 in support of Atlantic Flyway banding program goals.

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 2008, resident Canada goose banding was conducted by Bureau of Wildlife Management, regional personnel, and other volunteers that were organized into 3 banding crews operating in multiple regions (Regions 1 & 2, Regions 3 & 4 and Regions 5 & 6). The multi-crew approach is used to band a representative number of geese in the 6 physiographic strata (Figure 1) in which banding quotas are set using 1% of the 2006-08 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 metal leg bands.

Preseason (August through September) duck banding was conducted by Bureau of Wildlife Management biologists and biologist aides, Pennsylvania Game Commission (PGC) regional personnel (biologists, food & cover crew employees, and wildlife conservation officers), and banding volunteers at 20 sites in Erie, Crawford, Somerset, Bedford, Huntingdon, Pike, Wayne, Berks, Dauphin, Lancaster, and Northampton counties. Ducks were captured in shallow-water traps baited with shelled corn. Also, during nest checks in April and May, wood ducks were banded in Berks County, and mallards were banded in Crawford, Erie, and Mercer counties. 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 metal leg bands.

Following trapping efforts, banding data was compiled using Bandit software (BBL 2008). Electronic files of banding schedules were submitted to the BBL within 2 weeks of the conclusion of field banding efforts.

RESULTS

Resident Canada Goose Banding

Pennsylvania's 2008 banding quota for resident Canada geese was allocated for each physiographic stratum (Figure 1) according to the percentage of the state's goose population located in each stratum. The 2008 statewide quota of 2,494 represents 1% of the running 3-year average of the estimated statewide spring population. During the June 2008 resident Canada goose-banding period, 3,108 geese were banded, including 820 adult males, 780 adult females, 724 juvenile males, and 784 juvenile females at 38 locations in 21 counties (Tables 1 and 2). The statewide total exceeded the overall quota by 25%. The 3,108 geese banded in 2008 was similar to the 2007 total of 3,017 and the 2002-07 average of 3,065, Individual stratum quotas were met or exceeded in 3 of the 6 strata in 2008. The percentage of each stratum goal achieved ranged from 84% in stratum 10 to 204% in stratum 13. Since 2002, when we began using multiple-

crews, aggregate 7-year banding accomplishments have exceeded the aggregate stratum quotas by 1% to 33% and have exceeded the aggregate statewide quota by 19%. The multi-crew approach has greatly improved the distribution of the statewide banding sample than previously achieved using a single banding crew. This improves our ability to manage the resident Canada goose population at the state and strata level and reduce potential bias in population parameter estimation as additional years of banding and recovery information are obtained.

Geese were banded in 21 counties in all 6 PGC regions. More than 100 geese were banded at 11 locations: Pymatuning Wildlife Management Area (WMA), Crawford County; Pioneer Park Campground, Somerset County; Near Quakertown, Bucks County, Mont Alto, Franklin County, Beaver Springs, Snyder County, Lewisburg, Union County, Evans City and Cooperstown, Butler County, Valcourt and Lake Latonka, Mercer County, and the Allegheny River near East Brady, Armstrong County.

Gosling production, as indexed by the proportion of juveniles in the banded sample (48.5%) was above the 1988 to 2007 average of 44.7%. The number of juveniles per adult female banded was 1.93, above the 1988-2007 average of 1.64 and the highest since 2004. This indicates above average gosling production, and likely recruitment rates in 2008. We suspect favorable weather conditions that overlapped incubation and peak hatching periods across much of the state improved nest success rates over average levels. High, relatively stable recruitment rates are typical of temperate-nesting goose populations (Peters 2004, Jacobs and Dunn 2004).

A total of 252 geese banded in previous years were recaptured during banding operations (Table 1 and 2). Fifty-five of these recaptures were captured in a different 10-minute block than banded and are considered a foreign recapture.

Duck Banding

Pennsylvania's duck banding quotas as outlined in the North American Banding Program Document (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 preseason-banding period were generally average to below average for much of Pennsylvania, although timely rains did maintain water levels in northwest Pennsylvania. Low water levels in past years seemed to correlate with increase bandings by concentrating birds.

Bandings were up considerably this year over 2007. The 3,618 ducks banded pre-season was 23% above from last year’s total of 2,946, but was still 11% below the 1989 to 2007, average of 4,037 (Table 3 and 4). This is likely due to lower breeding populations of mallards and black ducks in the state. Atlantic Flyway banding quotas were met for juvenile mallards and juvenile wood ducks and were almost met for adult mallards, reaching 98% of the quota. Banding quotas were missed for adult wood ducks (87% attained) and adult and juvenile black ducks (32% and 22% of respective quotas).

As usual, mallards made up the largest species proportion of the total with 2,364

individuals banded (Table 3), up 23% from 2007, but down 16% from average. The 2008 mallard juvenile to adult female age ratio of 6.82 was 65% above the average of 4.12 and the highest ever observed during pre-season banding in Pennsylvania. The range for mallard age ratio's, since 1989, has been 2.16 to 6.74 juveniles per adult female until this year. The excellent production in 2008 led to the increased total mallard bandings. Wood duck bandings were up 43% from 2007 and were near average with 1,123 banded this year. The wood duck age ratio of 4.32 juveniles per adult female was similar to the average of 4.44 (range 2.47 to 6.64). Only 27 American black ducks were banded. This was similar to 2007 but down nearly 60% from average. The black duck age ratio was 5.5, above the average of 4.47. However, with relatively low number of black duck pre-season bandings, age ratios vary widely (range 1.73 to 30.25). Black duck bandings continue to fall short of flyway quotas and well below average levels. In 2008, the PGC was again awarded a grant from the Black Duck Joint Venture Northeast States Black Duck Banding Project Fund to expand preseason-banding efforts targeting black ducks in northeastern Pennsylvania. These efforts did not directly result in increased black duck bandings, but they helped maintain trapping efforts in this important waterfowl production area.

Besides the 3 species that are our primary banding focus, we also banded an additional 97 individuals of 5 other species (blue-winged teal, American green-winged teal, northern pintail, American wigeon and black-bellied whistling duck) plus 7 mallard X black duck hybrids (Table 4). Teal bandings were above average for the fourth consecutive year, mainly due to a productive banding site at Pymatuning WMA used the last 4 years.

Avian influenza monitoring was also an important component of the 2008 preseason banding efforts. One hundred twenty-nine samples of waterfowl were tested as part of combined state and federal early detection monitoring for the highly pathogenic form of avian influenza virus (HPAIH5N1). Results of this surveillance effort can be found in Cottrell 2008.

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 highly successful in increasing band-reporting rates (Koneff 2007a and Koneff 2007b). Higher reporting rates, in turn, enhance 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 inscription now fully implemented, reporting rates are believed to have stabilized; a large-scale reassessment of reporting rates is underway to ensure that harvest rates are being accurately estimated from band returns. The U.S. Fish and Wildlife Service (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. Reward banding was conducted in 2008 to allow for further refinement of harvest and reporting rate estimates for select species and also to examine if bands also inscribed with the web address had different reporting rates or methods than standard bands. In support of this research, 306 adult mallards, and 25 black ducks banded in Pennsylvania during 2008 were included in the reporting rate study by marking with specified combinations of reward and standard/control bands. Large-scale reward banding for the national

reporting rate study is now complete and data analysis is ongoing. Preliminary results suggest 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 (73%), and may explain why reporting rates for American black duck and migratory Canada geese are lower than the species mentioned previously. Information on current band reporting rates for various species will be used to help evaluate and, if necessary, revise banding quotas and geographical distribution of banding efforts at flyway and state levels to ensure that resources allocated to banding are addressing current information needs with maximum efficiency. The USFWS is currently scoping an updated North American Banding Needs Document that should begin guiding banding programs in 2010 (USFWS 2009).

From 1989-2007 Pymatuning WMA accounted for 74% of the total statewide duck bandings each year. In 2008, the 2,168 ducks banded at Pymatuning accounted for 60% of the total Pennsylvania duck bandings. Numbers of mallards and especially wood ducks banded at Pymatuning has declined since 2002. Pymatuning remains the top banding location for mallards in the Commonwealth with 82% of the statewide total. Compared with 2007 totals, bandings at Pymatuning increased 25% for mallards and 19% overall. Wood duck bandings accounted for 12% of the state total. There has been considerable effort to increase wood duck bandings at Pymatuning in recent years. Some improvement was achieved in 2008 but wood duck bandings are still below average.

Middle Creek WMA accounted for approximately 10% of total statewide duck bandings. The Middle Creek total was below the 1989-2007 average. Middle Creek was the second highest producer of mallards and tied for the top in wood duck bandings respectively in the state with 6% and 19% of the totals for each species.

Haldeman’s Island (Dauphin County) accounted for over 6% of the statewide banding total in 2008. This was similar the 1996-2007 average for this banding station. Bandings of wood ducks accounted for 19% of the state totals, similar to Middle Creek

Presque Isle (Erie County) accounted for 6% of the total duck bandings in 2008, down the 1989-2007 average annual total banded. Presque Isle accounted for nearly 4% of state mallard bandings and 11% of state wood duck bandings.

The 9 Northeast Region banding stations collectively accounted for 5.4% of all duck bandings and 11% of all wood duck bandings. The number of black ducks banded remained low at 6 despite the additional banding effort in this region funded through the Northeast U.S. grant from the Black Duck Joint Venture. The use of these funds will be reduced in 2009 and targeted to the most productive banding locations.

Very important, al beit lower numbers of preseason ducks were obtained from the remaining 7 banding locations across the state. One important component of preseason 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 state. This reduces potential bias in estimated population parameters (i.e. survival and harvest rates) than would otherwise occur from banding at relatively

few locations. We will continue efforts to add 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, bandings of these less common species include a higher percentage of migrants relative to locally breeding/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 104 individual blue-winged teal, green-winged teal, northern pintail, American wigeon, mallard X black duck hybrid, and black-bellied whistling duck were banded in 2008 (Table 4).

The BBL has also proposed a revision of banding rules that will clarify the permitting of banders and add the new classification of assistant banders (USGS-BRD, BBL 2009). This classification will replace the use of a banding authorization letter for banding of waterfowl and mourning doves using bait-trap techniques. We will be adding current staff participating in our banding program as either assistant banders or sub-permittee banders as the BBL approves the proposed rules.

RECOMMENDATIONS

1. Continue waterfowl banding efforts during FY 09 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 Technical Section band reporting rate studies, reassessment of banding needs, and other banding related activities affecting populations of waterfowl important to Pennsylvania.

3. Continue using Bandit software with updates to manage banding database. Train agency-banding staff on electronic entry and submission of banding data for the 2009 field season.

4. Acquire and distribute bands and equipment to field biologists for 2009 preseason banding program by June 2009.

5. Reduce the funding request from the Northeast U.S. Black Duck Joint Venture grant fund due to lack of performance at new banding locations and to focus efforts at productive locations 7-days per week.

6. Reclassify PGC banding cooperators as either assistant bander or sub-permittee bander when the BBL approves and implements its proposed rule.

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Table1. Numbers of resident Canada geese, by age and sex category, banded in Pennsylvania during 2008, plus recaptures of previously banded geese

		Adult		Juvenile			Recaptures			
Location name or nearest town	**Code**	**Male**	**Female**	**Male**	**Female**	**Total**	**Local**	**Foreign**	**Total**	**Total**
Strata 10 (quota 686, 84% achieved)										
Near Gettysburg	ADAM01	3	3	5	7	18			0	**18**
Near Cashtown	ADAM02	1	1	4	9	15	5		5	**20**
Stony Pt. Near East Berlin	ADAM05	5	5	25	11	46	1		1	**47**
8.5 Mi. N. of Reading	BERK03	9	10	9	12	40			0	**40**
2.5 Mi. SE of Quakertown	BUCK05	38	37	11	23	109	4		4	**113**
Middletown	DAUP04	23	28	5	6	62			0	**62**
Middle Creek Wildlife Management Area	LANC01	14	20	30	27	91	8		8	**99**
Near Lebanon	LEBA02	43	50	0	0	93			0	**93**
Near Fogelsville	LEHI03	25	26	0	0	51	16		16	**67**
Near Lynnville	LEHI05	20	19	6	4	49		1	1	**50**
Totals		**181**	**199**	**95**	**99**	**574**	**34**	**1**	**35**	**609**
Strata 13 (quota 339, 204% achieved)										
Near Mont Alto	FRAN02	18	18	54	53	143	1		1	**144**
4.5 Mi. S. of Shickshinny	LUZE02	0	1	6	8	15	1		1	**16**
4 Mi. SW of Dallas	LUZE03	6	7	6	7	26			0	**26**
Schuylkill River, near Auburn	SCHUY04	37	37	10	14	98			0	**98**
Sweet Arrow Lake near Pine Grove	SCHUY05	12	9	16	25	62		2	2	**64**
1.5 Mi. NW of Beaver Springs	SNYD02	24	25	34	46	129	1		1	**130**
Near Lewisburg	UNION01	33	24	60	78	195	2		2	**197**
New Berlin	UNION03	4	3	6	12	25	1		1	**26**
Totals		**134**	**124**	**192**	**243**	**693**	**6**	**2**	**8**	**701**
Strata 22 (quota 335, 105% achieved)										
Allegheny River near Kittanning	ARMS03	9	4	6	7	26	10		10	**36**
2.5 Mi. SW of Saxonburg	BUTL02	26	17	24	18	85	7		7	**92**
Near Evans City	BUTL05	17	19	45	34	115	13	7	20	**135**
Near Cooperstown	BUTL08	33	30	33	30	126		1	1	**127**
Totals		**85**	**70**	**108**	**89**	**352**	**30**	**8**	**38**	**390**

Table 1 (Cont.). Numbers of resident Canada geese, by age and sex category, banded in Pennsylvania during 2008, plus recaptures of previously banded geese.

		Adult		Juvenile			Recaptures			
Location name or nearest town	**Code**	**Male**	**Female**	**Male**	**Female**	**Total**	**Local**	**Foreign**	**Total**	**Total**
Strata 241 (quota 442, 193% achieved)										
Pymatuning Wildlife Management Area	CRAW01	96	89	140	156	481	63	2	65	**546**
Fletchers Pond, near Williams Corners	MERC03	40	23	13	18	94	5	23	28	**122**
Near Valcourt	MERC04	35	26	48	45	154	2	4	6	**160**
Near Lake Latonka	MERC07	29	24	42	28	123	29	3	32	**155**
Totals		**200**	**162**	**243**	**247**	**852**	**99**	**32**	**132**	**983**
Strata 242 (quota 406, 97% achieved)										
Allegheny River near East Brady	ARMS07	35	40	16	15	106		3	3	**109**
Allegheny River near Parker	ARMS08	8	9	0	2	19			0	**19**
Allegheny River near Emlenton	BUTL07	31	32	0	1	64			0	**64**
Pioneer Park Campground	SOME03	70	71	9	13	163	12	9	21	**184**
3 Mi. NW of Meyersdale	SOME04	15	13	8	6	42	2		2	**44**
Totals		**159**	**165**	**17**	**37**	**394**	**14**	**12**	**26**	**420**
Strata 243 (quota 285, 85% achieved)										
Sicklers' Pond near Tompkinsville	LACKA01	3	2	7	5	17	1		1	**18**
Wynooska Lake, near Greentown	PIKE05	26	21	0	0	47	6		6	**53**
6 Mi. SE of Gibson	SUSQ04	5	9	6	14	34			0	**34**
Dave's & PP&L Ponds near Lakeville	WAYN01	12	12	7	10	41	6		6	**47**
Spring Hill Airpark near Sterling	WAYN03	2	4	8	14	28			0	**28**
Near Honesdale	WAYNE07	10	9	17	17	53	1		1	**54**
Near Waymart	WAYNE09	3	3	8	9	23			0	**23**
Totals		**61**	**60**	**53**	**69**	**243**	**14**		**14**	**257**
Grand Total		**820**	**780**	**724**	**784**	**3,108**	**197**	**55**	**252**	**3,360**

Table 2. 2008 Canada goose bandings and recaptures by PGC Region and County.

Region	County	Total New Bandings	Total Recaptures
NW	Butler	390	28
	Crawford	481	65
	Mercer	371	66
	Total	1,242	159
SW	Armstrong	151	13
	Somerset	205	23
	Total	356	36
NC	Union	220	3
	Total	220	3
SC	Adams	79	6
	Franklin	143	1
	Snyder	129	1
	Total	351	8
NE	Lackawanna	17	1
	Luzerne	41	1
	Pike	47	6
	Susquehanna	34	0
	Wayne	145	7
	Total	284	15
SE	Berks	40	0
	Bucks	109	4
	Dauphin	62	0
	Lancaster	91	8
	Lebanon	93	0
	Lehigh	100	17
	Schuylkill	160	2
	Total	655	31

Table 3. Numbers of ducks banded in Pennsylvania during the 2008 pre-season banding period.

Banding Location	Mallard[a]					Wood Duck[a]					Black Duck[a]					Comb. Total
	AM	AF	JM	JF	Total	AM	AF	JM	JF	Total	AM	AF	JM	JF	Total	
NW Region																
Pymatuning WMA	264	152	842	675	1,933	50	17	37	31	135	12	2	4	3	21	2,089
Presque Isle	8	4	57	22	91	23	7	50	39	119	0	0	0	0	0	210
SW Region																
Somerset Mallard Rest	0	0	0	0	0	4	9	15	17	45	0	0	0	0	0	45
Near Somerset, CVS Wetlands	8	15	13	14	50	4	20	7	7	38	0	0	0	0	0	88
SC Region																
Bedford Co.	1	2	13	16	32	0	3	7	1	11	0	0	0	0	0	43
Haldeman Island	7	3	3	5	18	22	21	86	82	211	0	0	0	0	0	229
Huntingdon Co.	0	0	1	0	1	7	18	58	64	148[c]	0	0	0	0	0	149
NE Region																
Shohola Lake, SGL 180	0	2	16	8	26	0	3	10	9	22	2	0	1	1	4	52
Pecks Pond	0	2	2	5	9	1	4	6	3	15[d]	0	0	2	0	2	26
Promised Land State Park	4	4	7	6	21	1	2	2	6	11	0	0	0	0	0	32
Decker Pond, SGL 183	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Mud Pond Lackawanna Co.	0	0	1	3	4	1	1	0	0	2	0	0	0	0	0	6
Mud Pond Luzerne Co.	0	0	0	0	0	6	1	5	3	15	0	0	0	0	0	15
Daves & PPL, Wayne Co.	0	0	1	0	1	2	2	17	13	34	0	0	0	0	0	35
Near Honesdale, Wayne Co.	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Near Waymart, Wayne Co.	0	0	0	0	0	0	6	5	9	21[e]	0	0	0	0	0	21
SE Region																
Berks Co. Lake Ontelaunee	7	6	5	14	32	2	0	2	0	4	0	0	0	0	0	36
Dauphin County	0	0	0	0	0	6	9	8	10	33	0	0	0	0	0	33
Middle Creek WMA	31	70	27	17	146[f]	22	46	72	71	211	0	0	0	0	0	357
Northampton Co.	0	0	0	0	0	16	8	12	9	45	0	0	0	0	0	45

Table 3 (Cont.). Numbers of ducks banded in Pennsylvania during the 2008 pre-season banding period.

Banding Location	Mallard[a]					Wood Duck[a]					Black Duck[a]					Comb. Total
	AM	AF	JM	JF	Total	AM	AF	JM	JF	Total	AM	AF	JM	JF	Total	
Statewide Total	330	260	988	785	2,364	167	179	400	374	1,123	14	2	7	4	27	3,514
PA quota[b]		600[ad]	300	300	1,200		400[ad]	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 unknown age male.
[d] Includes 1 unknown age female.
[e] Includes 1 juvenile unknown sex.
[f] Includes 1 juvenile unknown sex.

Table 4. Numbers of other ducks banded in Pennsylvania during the 2008 pre-season banding period.

Banding Location	Species					
	Blue-winged teal	Green-winged teal	Northern pintail	American widgeon	Mallard X black duck hybrid	Black-bellied whistling-duck
NW Region						
Pymatuning WMA	39	24	13	1	1	1
Presque Isle	9	8	0	0	0	0
SC Region						
Haldeman's Island	0	0	0	0	1	0
Huntingdon Co.	1	0	0	0	0	0
NE Region						
Shohola Lake, SGL 180	0	0	0	1	2	0
Peck's Pond	0	0	0	0	2	0
SE Region						
Middle Creek WMA	0	0	0	0	1	0
Statewide Total	49	32	13	2	7	1

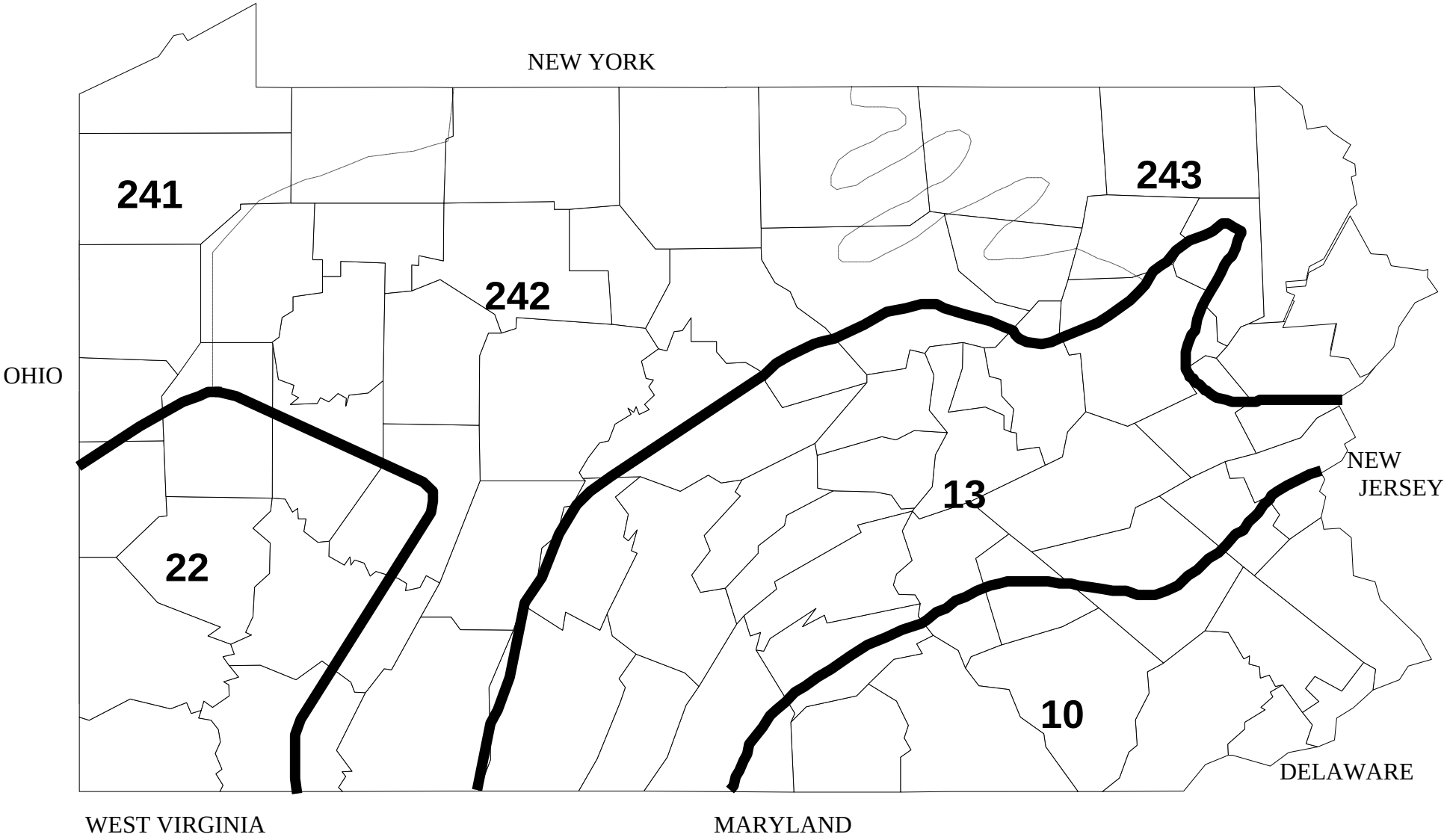

Figure 1. Physiographic strata used to subdivide Pennsylvania's resident Canada goose banding quota according to proportion of goose population.