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BUREAU OF WILDLIFE MANAGEMENT
RESEARCH DIVISION
PROJECT ANNUAL JOB REPORT

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TITLE: Waterfowl Research/Management

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TITLE: Waterfowl Banding

PERIOD COVERED: 1 July 2004 to 30 June 2005

COOPERATING AGENCIES: U.S. Fish & Wildlife Service (USFWS); U.S. Geological Survey, Biological Resources Division (USGS-BRD); Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry and Bureau of State Parks; Pennsylvania Department of Transportation

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 a cooperative effort by state, provincial, and federal agencies in the Atlantic Flyway that provides crucial data for management of the waterfowl resource. During June 2004, 3,372 resident Canada geese (>100% of the state quota) were banded at 53 locations across Pennsylvania. Excellent gosling production and the use of 2 goose banding crews also enabled banding quotas for each of the 6 individual physiographic strata to be exceeded. During the August-September 2004 pre-season banding period, 2,610 ducks were banded in Pennsylvania, including 1,723 mallards, 805 wood ducks, 31 black ducks, and 51 individuals of 5 other species (blue-winged teal, green-winged teal, mallard x black duck hybrid, northern pintail, and American wigeon). Banding quotas were attained for juvenile mallards and wood ducks, but not for adult mallards or wood ducks or adult or juvenile black ducks. Despite excellent wetland habitat conditions due to continuing abundant precipitation (which again negatively affected the success of duck trapping efforts), production of mallards and wood ducks was only average, possibly due to adverse weather conditions during the nesting and early brood rearing period. Waterfowl banding should continue during 2005 in support of Atlantic Flyway banding program goals.

OBJECTIVE

To band representative samples of wild waterfowl as part of a cooperative effort by state, provincial, and federal agencies in the Atlantic Flyway that provides crucial data (survival and harvest rates, migration timing and destination, 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 of the stewardship of the waterfowl resource at state and flyway levels.

METHODS

During June 2004, resident Canada goose banding was conducted at 53 locations in 27 counties (Table 1) by Migratory Game Bird Section personnel, with assistance from other PGC personnel and volunteers. As in 2002 and 2003, 2 banding crews were used for most of the banding period, with 1 crew concentrating on the eastern half of the state and the other on the western portion. 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 butt-end metal USFWS "1-800" leg bands.

Preseason (August through September) duck banding was conducted by Bureau of Wildlife Management personnel at 9 sites in Erie, Crawford, Cumberland, Dauphin, Lancaster, and Pike counties, and by Wildlife Conservation Officers (WCOs) and temporary personnel at various locations in Bedford, Greene, Northampton, Philadelphia, Somerset, and Washington counties. Ducks were captured in portable and permanent traps baited with corn. Also, 17 adult female wood ducks were banded in Berks County in May during nest box checks. 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 butt-end metal USFWS "1-800" leg bands.

The transition to "1-800" bands (inscribed with a toll-free telephone number for reporting band recoveries), begun in the mid-1990's, appears to have been highly successful in increasing band-reporting rates (Patuxent Wildlife Research Center 2000). 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 have been changing and uncertain, temporarily precluding direct estimation of harvest rates. With the "1-800" band program now fully implemented, a large-scale reassessment of reporting rates is underway 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 in 2003 to address the possibility of different reporting rates for species other than mallards, and similar efforts continued in 2004. In support of this research, 450 adult resident Canada geese, 440 wood ducks, and 433 adult mallards banded in Pennsylvania during 2004 were included in the reporting rate study by marking with specified combinations of reward and standard/control bands, as per USFWS instructions for each species. Large-scale reward banding for the national reporting rate study is now complete and data analysis is ongoing. Preliminary results from 2003 suggested that Atlantic Flyway reporting rates were approximately 50-60% for mallards and black ducks, 65% for resident Canada geese, and 70% for wood ducks. Upon completion of the analyses, the 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.

Following trapping efforts, banding data was compiled using Band Manager Version 2.1 software. As requested, both electronic files and hard copies of banding schedules were submitted to the USGS-BRD Bird Banding Laboratory.

RESULTS

Resident Canada Goose Banding

Pennsylvania's 2004 banding quota for resident Canada geese (set to reflect approximately 1% of the running 3-year average of the estimated statewide spring population) was 2,626 birds. This quota was subdivided into goal amounts for physiographic strata (Fig. 1) according to the percentage of the state's goose population located in each stratum. During the June 2004 resident Canada goose banding period, 3,372 geese were banded, including 842 adult males, 795 adult females, 810 juvenile males, and 925 juvenile females (Table 1). The statewide total exceeded the overall quota by 28%. More than 100 geese were banded at 10 locations: North Park (Allegheny Co.) (300 geese banded), Pymatuning WMA, Muddy Run Reservoir (Lancaster Co.), Middle Creek WMA, Talmage/Conestoga River (Lancaster Co.), PPL Montour Preserve (Montour Co.), Cowanesque Lake (Tioga Co.), SGL 218 (Erie Co.), Kellyman Farm (Crawford Co.), and Hartstown (Crawford Co.) Pennsylvania typically experiences the strong annual gosling recruitment associated with temperate-nesting goose populations, but production in 2004 appeared especially robust. Large brood sizes were noted at many traditional banding sites, and the overall proportion of juveniles in the banded sample (51%) was higher than in any of the previous 5 years (range 38%-46% juveniles, average 42%).

The 2-crew approach was again highly successful in ensuring that the statewide quota was reached, and especially in maintaining adequate distribution of banding effort among the 6 physiographic strata. Individual strata quotas were exceeded for all 6 strata (Table 1). In years prior to the use of 2 banding crews, quotas were often <75% attained for strata with lower goose densities. Maintaining a proportionate distribution of the statewide quota, as achieved in 2002-2004, increases the likelihood that conclusions drawn from band recovery analyses are representative of Pennsylvania's entire Canada goose population.

Duck Banding

Pennsylvania's duck banding quotas as outlined in the North American Banding Program Document 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).

During the 2004 preseason banding period, 2,610 ducks were banded in Pennsylvania (Tables 2 and 3). Quotas were met for juvenile mallards and juvenile wood ducks, but not for adult mallards, adult wood ducks, or adult or juvenile black ducks. Total bandings were 21% below the 2003 banding effort and 40% below the annual average for the 1994-2003 period. Reduced duck trapping success in 2003 and 2004 can most likely be attributed to above normal wetland water levels at all banding stations due to abundant precipitation throughout both years. Similar reductions in trapping success have occurred during previous wet years. When water is abundant on the landscape, ducks are less likely to concentrate on the larger water bodies where trapping efforts are centered, and natural foods tend to be more accessible, reducing the attractiveness of bait.

Mallard bandings decreased 33% from 2003. The banding quotas for juvenile mallards were exceeded, but adult bandings were 9% below the quota. This was the first time since current banding quotas were established in 1989 that any mallard quota was not achieved in Pennsylvania. Wood duck bandings increased 33% from 2003. Wood duck quotas were exceeded for juveniles, but adult wood duck bandings fell 32% short of the quota. The adult wood duck quota has been met only once in the past 5 years, averaging 22% below quota over this period. Black duck bandings (31) were similar to the 34 banded in 2003; none of the quotas were met.

Following several years of steady decline, black duck bandings have been fairly stable over the last 4 years, but at a level well below quotas and historical totals. Via further experimentation with banding sites and techniques, efforts should continue to increase the number of black ducks banded, but it may also be necessary to reassess the feasibility of Pennsylvania's black duck banding quotas as Atlantic Flyway banding needs are reviewed following analysis of reporting rate study information.

Juveniles comprised near average percentages of both mallard and wood duck bandings in 2004. The abundance of water made for generally excellent breeding and brood rearing habitat conditions, but this may have been offset somewhat by the adverse effects of spring weather (flooding and below-average temperatures) on nest success and early brood survival.

Pymatuning WMA accounted for 53% of the total duck bandings and was the top banding location for mallards, with 74% of the statewide total. Compared to 2003, bandings at Pymatuning decreased 35% for mallards and 34% overall. Wood duck bandings increased 47%.

Middle Creek WMA and Presque Isle (Erie Co.) each accounted for about 11% of the total duck bandings. Total bandings decreased 19% at Middle Creek, due mainly to a 49% decrease in mallard bandings, and increased 24% at Presque Isle, due mainly to a 35% increase in mallard bandings. Wood duck bandings increased 31% at Middle Creek and decreased 23% at Presque Isle.

The 4 Pike County stations, Shohola Lake, Decker Pond, Pecks Pond, and Promised Land State Park, collectively accounted for 9% of all duck bandings. Total bandings at these stations increased 6% from 2003. Pike County was the top area in the state for both wood ducks (22% of all 2004 Pennsylvania bandings, with a 13% increase from the previous year) and black ducks (65% of all 2004 Pennsylvania bandings, with the number banded increasing from 12 to 20). Mallard bandings decreased 14%.

Haldeman Island (Dauphin Co.) accounted for 7% of the statewide total. Bandings increased 16% for wood ducks, but decreased 55% for mallards and 14% overall.

New banding stations were added in Greene (SGL 223), Washington (SGL 232), and Somerset (Louie Beachy Wetlands) Counties. Although these stations did not band large numbers of ducks overall, they contributed mallards and wood ducks from physiographic strata 22 and 242 to the banded sample, resulting in ducks being banded in all 6 of Pennsylvania's physiographic strata for the first time. Maximizing the geographic distribution of the banded sample is important because habitat, hunting pressure, and other factors affecting duck populations vary geographically across Pennsylvania. The more of this variability captured in the banding data, the more representative the banded sample is of the entire population, and the better the quality of the inferences made from banding and recovery data about duck populations in general. Duck banding effort should be maintained and, if possible, expanded at both traditional and new banding stations throughout Pennsylvania to provide the most reliable data for waterfowl management programs.

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. The total number of individuals of these less common species banded statewide in 2004 declined from 2003 (Table 3), with a substantial decrease in the number of blue-winged teal banded at Pymatuning WMA accounting for most of the difference. Bandings decreased statewide compared to 2003 for blue-winged teal, mallard x

black duck hybrids, and northern pintails, and increased for green-winged teal. An American wigeon banded at Pymatuning WMA was an unusual addition to Pennsylvania's banding totals this year.

RECOMMENDATIONS

1. Continue waterfowl banding efforts during FY 05 in support of the Atlantic Flyway cooperative banding program. Continue efforts to distribute Canada goose bandings proportionally to populations in each physiographic stratum, to increase the number of black ducks banded, and to maximize the geographic distribution of mallard and wood duck bandings.

2. Participate as needed with USFWS and Atlantic Flyway Technical Section Banding Committee and species committees in analysis of band reporting rate studies, and in reassessment of banding needs.

LITERATURE CITED

- Bellrose, F. C. 1976. Ducks, geese, and swans of North America. Stackpole Books, Harrisburg, Pennsylvania, USA.
- Carney, S. M. 1992. Species, age, and sex identification of ducks using wing plumage. U. S. Fish & 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, ed. 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.
- Patuxent Wildlife Research Center. 2000. Increasing band reporting rates via a 1-800 telephone number. U. S. Department of the Interior, U. S. Geological Survey, Biological Resources Division. Laurel, Maryland, USA.

Table 1. Numbers of resident Canada geese, by age and sex category, banded in Pennsylvania during June, 2004.

Banding Location	County	AM ^a	AF	JM	JF	Total	Stratum Goal	Percent of Stratum Goal
Stratum 10								
Bast Farm	Adams	1	0	2	3	6		
Cashtown	Adams	8	9	13	14	44		
Grimes Farm	Adams	7	9	15	27	58		
Linca Farm	Adams	13	19	2	4	38		
Struble Lake	Chester	10	11	12	23	56		
Middle Creek WMA	Lancaster	18	17	48	45	128		
Muddy Run Reservoir	Lancaster	17	20	48	60	145		
Talmage (Conestoga River)	Lancaster	35	30	26	36	127		
Fort Washington Office Center	Montgomery	5	4	9	21	39		
Green Lane Reservoir	Montgomery	30	30	16	12	88		
Talamore Country Club	Montgomery	14	19	10	9	52		
Long Arm Dam	York	26	26	14	18	84		
Stratum Total		184	194	215	272	865	698	124%
Stratum 13								
Bald Eagle State Park	Centre	7	9	9	5	30		
Camp Victory	Columbia	7	7	6	4	24		
Haldeman Island	Dauphin	14	7	30	46	97		
PPL Montour Preserve	Montour	41	43	11	21	116		
Lake Minsi	Northampton	20	14	8	19	61		
Selinsgrove Bypass Pond	Snyder	21	15	6	10	52		
Lewisburg Penitentiary	Union	11	13	15	21	60		
Stratum Total		121	108	85	126	440	316	139%
Stratum 22								
Deer Lake	Allegheny	8	5	1	2	16		
North Park	Allegheny	115	115	35	35	300		
Outdoor Lodge	Allegheny	19	23	10	12	64		
Kittanning	Armstrong	33	35	11	20	99		
Linden Lake	Fayette	20	17	3	7	47		
Knizer Farm	Washington	15	12	13	13	53		
Lake Jo Ann	Washington	13	14	14	12	53		
Washington Reservoir # 3	Washington	9	7	6	10	32		
Stratum Total		232	228	93	111	664	442	150%

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

Table 1. (cont.). Numbers of resident Canada geese, by age and sex category, banded in Pennsylvania during June, 2004.

Banding Location	County	AM ^a	AF	JM	JF	Total	Stratum Goal	Percent of Stratum Goal
Stratum 241								
Hartstown	Crawford	17	18	31	34	100		
Kellyman Farm	Crawford	17	17	31	36	101		
Pymatuning WMA	Crawford	37	20	67	71	195		
Chapman Farm	Erie	7	8	5	10	30		
SGL 218	Erie	16	16	39	36	107		
Stratum Total		94	79	173	187	533	454	117%
Stratum 242								
Miller Farm	Armstrong	2	3	5	6	16		
Sugar Creek Rest Home	Armstrong	17	20	12	12	61		
Gilford Pond	Clarion	4	3	2	0	9		
Tionesta	Forest	17	12	15	15	59		
Galeton	Potter	16	10	5	7	38		
Cowanesque Lake	Tioga	42	33	19	17	111		
Hammond Lake	Tioga	14	12	16	12	54		
Justus Lake	Venango	4	4	15	11	34		
Polk Hospital	Venango	9	8	14	7	38		
President	Venango	19	15	5	8	47		
Stratum Total		144	120	108	95	467	396	118%
Stratum 243								
Bowens Pond	Bradford	4	4	23	31	62		
Bride Farm	Bradford	2	3	18	14	37		
Cooks Pond	Bradford	5	6	9	9	29		
Lake Bonin	Bradford	6	4	3	7	20		
Rienze	Bradford	5	5	11	8	29		
Sickler's Pond	Lackawanna	6	9	15	18	48		
Acre Lake	Susquehanna	17	10	19	14	60		
Marshall Pond	Susquehanna	10	10	18	14	52		
Williams Corner	Susquehanna	2	4	12	7	25		
Wright Farm	Susquehanna	1	1	0	1	3		
James Pond	Wyoming	9	10	8	11	38		
Stratum Total		67	66	136	134	403	320	126%
Statewide Total		842	795	810	925	3,372	2,626	128%

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

Table 2. Numbers of mallards, wood ducks, and black ducks, by age and sex category, banded in Pennsylvania during the 2004 pre-season banding period.

Banding Location	Mallard					Wood Duck					Black Duck					Grand Total
	AM ^a	AF	JM	JF	Total	AM	AF	JM	JF	Total	AM	AF	JM	JF	Total	
Pymatuning WMA	196	166	493	414	1,269	24	9	31	24	88	3	0	1	4	8	1,365
Presque Isle	50	29	92	61	232	13	4	20	4	41	0	0	1	0	1	274
Louie Beachy Wetlands	0	2	0	0	2	0	2	2	3	7	0	0	0	0	0	9
SGL 223	0	0	0	0	0	0	0	12	15	27	0	0	0	0	0	27
SGL 232	0	0	0	2	2	1	0	12	11	24	0	0	0	0	0	26
SGL 169	0	0	0	0	0	1	6	10	16	33	0	0	0	0	0	33
Bedford Co.	1	0	2	4	7	0	1	13	6	20	0	0	0	0	0	27
Shohola Lake, SGL 180	0	4	17	12	34 ^b	13	4	32	29	78	0	0	4	4	8	120
Decker Pond, SGL 183	0	0	0	0	0	3	2	11	7	23	0	0	0	0	0	23
Pecks Pond	0	0	5	11	16	6	12	27	20	65	1	0	2	9	12	93
Promised Land State Park	0	0	0	1	1	3	2	1	3	9	0	0	0	0	0	10
Middle Creek WMA	13	58	22	14	107	25	40	60	43	168	0	2	0	0	2	277
John Heinz NWR	3	1	3	4	11	0	0	0	0	0	0	0	0	0	0	11
Haldeman Island	7	16	6	13	42	8	48	33	56	145	0	0	0	0	0	187
Northampton Co.	0	0	0	0	0	10	17	20	13	60	0	0	0	0	0	60
Berks Co.	0	0	0	0	0	0	17 ^c	0	0	17	0	0	0	0	0	17
Statewide Total	270	276	640	536	1,723	107	164	284	250	805	4	2	8	17	31	2,559

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

^b Totals include 1 juvenile mallard-sex unknown.

^c Captured in nest boxes during spring 2004.

Table 3. Numbers of blue-winged teal, green-winged teal, mallard x black duck hybrids, northern pintails, and American wigeons banded in Pennsylvania during the 2004 pre-season banding period.

Banding Location	Species					Total
	Blue-winged Teal	Green-winged Teal	Mallard x Black Duck Hybrid	Northern Pintail	American Wigeon	
Pymatuning WMA	11	8	3	4	1	27
Presque Isle	11	0	0	0	0	11
Louie Beachy Wetlands	0	0	0	0	0	0
SGL 223	0	0	0	0	0	0
SGL 232	0	0	0	0	0	0
SGL 169	0	0	0	0	0	0
Bedford Co.	1	0	0	0	0	1
Shohola Lake, SGL 180	0	0	2	0	0	2
Decker Pond, SGL 183	0	0	0	0	0	0
Pecks Pond	0	0	2	0	0	2
Promised Land State Park	0	0	0	0	0	0
Middle Creek WMA	1	4	0	1	0	6
John Heinz NWR	0	0	0	0	0	0
Haldeman Island	0	2	0	0	0	2
Northampton Co.	0	0	0	0	0	0
Berks Co.	0	0	0	0	0	0
Statewide Total	24	14	7	5	1	51

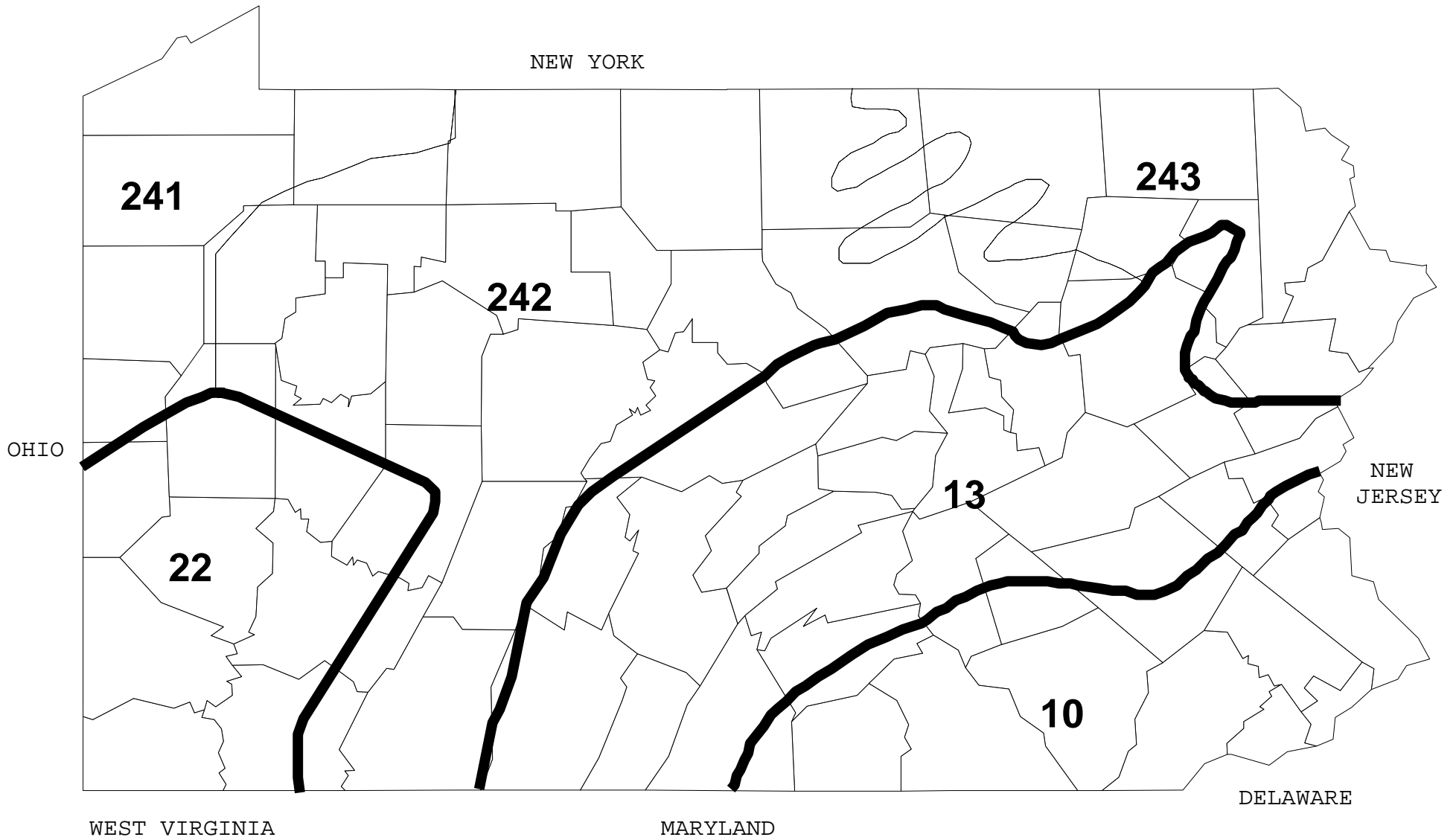


Fig. 1. Physiographic strata used to subdivide Pennsylvania's resident Canada goose banding quota according to proportion of goose population.