

**PENNSYLVANIA GAME COMMISSION
BUREAU OF WILDLIFE MANAGEMENT
RESEARCH DIVISION
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TITLE: Game Take and Furtaker Surveys

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COOPERATING AGENCIES: Bureau of Automated Technology Services (BATS), Bureau of Administrative Services

WORK LOCATION(S): Harrisburg, Pennsylvania

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Abstract: A questionnaire was mailed to a random sample of purchasers of a 1999 general hunting license (20,101 questionnaires mailed) to estimate number of hunters, harvest, and hunter-days of small game species during the 1999-00 hunting season. After three mailings, 66.2% responded. Overall, between 1998-99 and 1999-00 hunting seasons, harvests and hunter numbers changed little, but hunter days declined. Seventeen-year trends in harvest and hunter participation indicate a continued decline for nearly all small game species. A separate questionnaire was mailed to a random sample of purchasers of a furtaker license (2,142 mailed) to estimate harvest of furbearer species and trapper-days. After two mailings, 74.5% responded. The harvest of furbearer species and the number of hunters/trappers decreased between the 1998-99 and 1999-00 seasons. Seventeen-year trends for harvests of furbearers indicate harvests have declined dramatically for most species since 1983. 1999-00 furbearer harvests and hunter estimates are biased low because most junior and senior license buyers had furtaker privileges without buying a furtaker license. A correction factor was developed based on adult furtakers, but we may not be able to completely resolve this problem until we move to a computerized licensing system.

OBJECTIVES

To estimate the number of animals harvested, number of participants, and number of days spent hunting (hunter-days) for small game species during the 1999-00 hunting season. To estimate the number of furbearers trapped or shot and number of trappers/hunters during the 1999-00 furbearer seasons. To monitor

long-term trends in harvest, number of hunters and trappers, hunter-days, and harvest per 100 hunter-days.

PROCEDURES

In March 2000, following the close of trapping and small game hunting seasons, the names and addresses of general hunting license buyers whose license number ended in either 01 or 51, and furtakers whose license number ended in either 1 or 6, were drawn from the duplicate licenses on file in the License Division of the Bureau of Administrative Services. Photocopies of the duplicates were used by BATS to prepare the mailing list. BATS and Bureau of Administrative Services addressed and mailed 20,101 Game Take questionnaires and 2,142 Furtaker questionnaires. In addition to the initial mailing, two follow-up mailings were sent to nonrespondents of the Game Take Survey and one follow-up mailing was sent to nonrespondents of the Furtaker Survey.

These surveys reflect major changes from pre-1990 surveys in the information requested from hunters and trappers. First, information about small game and furbearer species were separated into Game Take and Furtaker Surveys, respectively. Second, the Game Take questionnaire was expanded to include more harvestable species and the number of days of hunting per species per county. Third, harvest and hunting effort on shooting preserves were requested separately for ring-necked pheasant, quail, and ducks. Fourth, estimates of coyote harvest include those shot by hunters (Game Take Survey excluding Furtaker license buyers) and those trapped or shot by furtakers (Furtaker Survey). Fifth, a cover letter to encourage response was included in all mailings.

During 1990-99, methods used to survey small-game hunters and furtakers have been the same with the following exceptions. The Game Take Survey for 1992 consisted of 2/3 the usual sample size (i.e., every third 01 or 51 license was skipped) and only two mailings were conducted, but a telephone survey of nonrespondents was conducted to estimate nonresponse bias. Estimates using the standard estimation techniques (Shope 1985) were similar to those obtained when incorporating nonresponse bias (Diefenbach 1993). Therefore, estimates from the 1992 survey should be comparable to results from other years. In 1996 hunters were asked to report their Canada goose harvest by season (early, regular, late), and their snow goose harvest. This change was implemented to assess the effect of special goose seasons since the regular season was closed for most of the state, and to compare our estimates to those obtained by the newly-implemented Migratory Bird Harvest Information Program. In 1998 and 1999 Game Take Survey turkey hunters were to report the management unit in which they hunted instead of the county.

The 1999 furtaker survey sampled those who purchased a furtaker license but not those who purchased junior and senior combination licenses which include furtaker privileges. As a result of this licensing change, furtaker harvest and participation estimates beginning in 1999 are biased low compared to pre-1999 estimates. To reduce this bias, I developed a "correction factor" where harvests and participation of resident adult furtakers (i.e., the only group not affected by the combination licenses and the majority of furtakers) were related to total harvests and participation in previous years. Using these correction factors, 1999 estimates were corrected to reduce bias. The basic assumption of this analysis was that the relationship between resident adult harvest and participation and total harvest and participation pre-1999 is similar to 1999. Although unable to directly evaluate this assumption, data from previous years suggests minimal change in this relationship. From 1990-1998 (excluding 1994), adult harvest and participation explained 93%

of all variation in total harvest and participation for each species (Tables [1](#) and [2](#)). In some cases, “correction factors” are being used to predict beyond the range of values used to estimate these factors. Although this is not recommended, there is no evidence to suggest substantial changes in the relationship between adult and total harvests and participation beyond the values used in regression analysis.

Based on previous years’ surveys, relationships between resident adults and all furtakers were estimated using regression analysis (i.e., $Y_{total} = \beta_0 + \beta_1 X_{adult}$) for each species. Parameter estimates of slope (i.e., β_1) were then used as “adult correction factors” to make inferences about total furtaker estimates based upon information collected from resident adults. Y-intercept parameter estimates (i.e., β_0) from regression analyses were not included in correcting adult estimates because y-intercept estimates were based upon furtaker sample responses and not population estimates.

The steps of analysis were as follows. First, numbers of adult furtakers pursuing each species and descriptive statistics of adult furtaker harvests and participation for each species were calculated from survey responses. Second, regression analysis was used to estimate (i.e., slope estimate from regression) the relationship or “correction factor” between sample adult responses and total sample responses. Third, sample responses for 1999 were then expanded to population estimates for resident adult furtakers (Scheaffer et al. 1979). Finally, “correction factors” and population estimates were combined to calculate corrected estimates with accompanying variances (Mood et al. 1974).

Respondents to the Game Take Survey were post-stratified on the basis of whether or not they had purchased special licenses or stamps, to reduce the effect of nonresponse bias on estimates (see Shope 1985). Nonresponse bias for the Furtaker Survey was not corrected.

I estimated (by species) total harvest, number of participants, hunter-days, and harvest per 100 hunter-days based on 991,327 general hunting licenses sold for the Game Take Survey, and 17,591 furtaker licenses sold for the Furtaker Survey. I estimated trends over time using Pearson product-moment correlation coefficients.

FINDINGS

For the Game Take and Furtaker Survey respectively, 12,810 and 1,557 useable, returned questionnaires were processed. The response rates, after adjusting for deceased license buyers and undeliverable questionnaires, were 66.2% for the Game Take Survey and 74.5% for the Furtaker Survey. The response rate for the Game Take and Furtaker surveys increased about 3% from the previous year.

During 1999-00, 2,874 hunters harvested an estimated 9,703 snow geese during 12,344 hunter-days. This represents an increase in harvests and harvest rates from the 1998-99 season, when 3,394 hunters harvested 4,828 snow geese during 15,420 hunting days.

Annual changes.--Harvests of 10 of 12 small game species declined, however, quail and duck harvests increased ([Table 3](#)). The number of hunters and hunter-days declined for 10 of 12 small game species (Tables [4](#) and [5](#)). Turkey harvests, hunters, and hunter days increased for both the spring and fall seasons. Increases in turkey-related numbers might have been influenced by a procedural error in the 1998-99 survey

that may have resulted in low estimates in 1998-99 (Diefenbach 1999).

Harvest per 100 hunter-days increased for 9 of 12 small game species ([Table 6](#)). Rabbit, woodcock, and goose hunters reported declines in success rates.

The number of hunters/trappers of furbearers declined at least 20% for all species except coyotes ([Table 7](#)). Harvests for all furbearer decreased by at least 18% except for mink ([Table 8](#)).

Seventeen-year trends.--Harvest declined ($P < 0.10$) for all species except turkey, geese, and ducks ($P < 0.10$), although the trends for crow ($P = 0.30$) and quail ($P = 0.16$) were not significant ([Table 3](#)). Number of hunters has declined for all seasons/species ($P < 0.10$) except spring turkey and ducks ([Table 4](#)).

Number of hunters/trappers of most furbearer species has increased or remained stable since 1990, although the number of hunter/trappers pursuing raccoons has declined ($r = -0.800$, $P < 0.01$) since 1983. The number of hunters and trappers pursuing coyotes has continued to increase ($r = 0.981$, $P < 0.01$) ([Table 7](#)). The harvest of all furbearers for which we have 1983-99 data has declined ($P < 0.06$).

RECOMMENDATIONS

Harvest and participant data collected from the game take and furtaker surveys are the best source for this type of data; thus, I recommend continuing this survey. The addition of combination licenses reduces reliability of furtaker estimates, and the correction method should be viewed as a stop gap measure and not a long-term substitute for appropriate sampling methods. A computerized license database could eliminate the need for the temporary correction factor. If the response rate for the Furtaker Survey becomes $<70\%$ I recommend conducting a third mailing.

Major changes to the Game Take and Furtaker Surveys only should be instituted when more efficient sampling of license buyers is possible. When the Game Commission implements a computerized licensing system, samples that are stratified by license type and location of residence will provide more accurate and precise harvest estimates. When such a system is implemented, phone calls to obtain estimates of harvest and hunting effort of nonrespondents to the mail survey may be useful. A computerized licensing system would allow us to survey hunters much sooner after hunting seasons ended, which has been shown to result in more accurate estimates of harvest and hunter participation (e.g., Barker 1991). Moreover, a computerized license system would provide greater flexibility in adapting sampling methods to future licensing changes that may reduce the reliability of estimates.

LITERATURE CITED

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Table 1. Relationships between resident adult furtaker harvests and total furtaker harvests by species, 1990 – 1998, excluding 1994.

Species	Relationship between reported harvests	R ²	P	“Correction factor” ^a
Raccoon	Total harvest = -369.13 + 1.21(Adult harvest)	0.9879	<0.0001	1.21
Muskrat	Total harvest = 161.43 + 1.14(Adult harvest)	0.9831	<0.0001	1.14
Red Fox	Total harvest = 18.32 + 1.10(Adult harvest)	0.9876	<0.0001	1.10
Gray Fox	Total harvest = -343.24 + 1.26(Adult harvest)	0.9860	<0.0001	1.26
Coyote	Total harvest = -6.33 + 1.11(Adult harvest)	0.9983	<0.0001	1.11
Mink	Total harvest = -17.35 + 1.14(Adult harvest)	0.9648	<0.0001	1.14
Beaver	Total harvest = -3.85 + 1.13(Adult harvest)	0.9970	<0.0001	1.13
Skunk	Total harvest = 83.95 + 1.07(Adult harvest)	0.9399	<0.0001	1.07
Weasel	Total harvest = 10.69 + 0.99(Adult harvest)	0.9759	<0.0001	0.99
Opossum	Total harvest = -63.60 + 1.21(Adult harvest)	0.9770	<0.0001	1.21

^a“Correction factor” is the slope estimate in the regression equation.

Table 2. Relationships between resident adult furtakers and total furtakers by species, 1990 – 1998, excluding 1994.

Species	Relationship between reported furtakers	R ²	P	“Correction factor” ^a
Raccoon	Total furtakers = -29.28 + 1.24(Adult furtakers)	0.9853	<0.0001	1.24
Muskrat	Total furtakers = 4.40 + 1.22(Adult furtakers)	0.9892	<0.0001	1.22
Red Fox	Total furtakers = -22.45 + 1.18(Adult furtakers)	0.9913	<0.0001	1.18
Gray Fox	Total furtakers = -29.09 + 1.19(Adult furtakers)	0.9894	<0.0001	1.19
Coyote	Total furtakers = -20.36 + 1.16(Adult furtakers)	0.9990	<0.0001	1.16
Mink	Total furtakers = -10.66 + 1.22(Adult furtakers)	0.9696	<0.0001	1.22
Beaver	Total furtakers = -8.59 + 1.22(Adult furtakers)	0.9941	<0.0001	1.22
Skunk	Total furtakers = 0.19 + 1.23(Adult furtakers)	0.9777	<0.0001	1.23
Weasel	Total furtakers = -3.80 + 1.29(Adult furtakers)	0.9519	<0.0001	1.29
Opossum	Total furtakers = -19.71 + 1.30(Adult furtakers)	0.9926	<0.0001	1.30

^a“Correction factor” is the slope estimate in the regression equation.

Table 3. Harvest, by species, 1983-99, Pennsylvania.

Year	Spring turkey	Fall turkey	Rabbits	Grouse	Squirrel	Pheasant ^a	Woodcock
1983	10,852	20,494	2,156,565	493,737	2,259,320		186,319
1984	9,723	15,844	1,939,399	475,960	2,256,311		170,296
1985	14,197	18,217	2,137,737	511,271	2,428,683		137,183
1986	16,155	26,763	2,092,910	536,553	2,833,061		165,685
1987	14,674	28,346	1,764,744	484,016	2,364,596		175,124

1988	14,659	22,515	1,930,737	523,271	2,313,153		165,590
1989	17,154	21,669	1,696,712	410,371	2,206,719		143,502
1990	17,472	25,527	1,672,360	353,647	2,044,264	302,276	50,918
1991	16,606	31,979	1,462,270	293,891	1,632,108	269,065	53,183
1992	18,180	21,468	1,488,850	254,539	1,761,285	261,541	51,246
1993	24,068	30,477	1,160,939	272,690	1,585,368	250,149	52,959
1994	28,558	39,094	1,025,319	304,162	1,826,618	236,698	29,654
1995	36,401	49,748	1,010,938	315,197	1,599,104	250,930	28,624
1996	33,726	35,787	807,072	218,256	1,442,560	215,502	26,846
1997	30,956	37,398	827,520	187,770	1,352,038	219,864	23,878
1998	32,661	33,628	911,003	183,468	1,331,051	216,669	31,602
1999	37,806	40,718	715,862	177,355	1,236,108	211,257	25,704
r ^b	0.936	0.803	-0.972	-0.933	-0.907	-0.932	-0.908
P	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Year	Quail ^a	Dove	Geese	Ducks ^a	Hare	Woodchuck	Crow
1983		1,690,158	68,333		10,867		
1984		1,402,180	64,452		13,989		
1985		1,443,109	56,233		14,749		
1986		1,531,868	69,748		13,189		

1987		1,374,110	68,541		14,412		
1988		1,520,322	49,573		8,488		
1989		1,209,438	78,821		7,595		
1990	7,879	1,022,402	72,901	98,026	3,615	1,299,647	355,492
1991	3,005	968,421	69,127	87,478	3,579	1,304,020	257,009
1992	1,236	734,707	78,883	93,687	3,961	1,157,090	185,192
1993	4,837	735,089	84,251	133,354	2,114	1,274,166	191,639
1994	2,902	669,459	102,979	128,164	3,352	1,284,819	247,219
1995	1,204	670,791	64,382	156,511	2,997	1,225,101	295,962
1996	3,387	603,114	96,910	151,142	1,582	1,149,995	275,541
1997	1,766	506,677	115,506	188,034	1,432	1,251,145	184,944
1998	241	562,348	131,831	146,050	2,507	1,204,582	247,047
1999	3,938	519,116	128,385	164,328	2,412	1,117,970	209,273
r ^b	-0.485	-0.958	0.813	0.863	-0.882	-0.627	-0.363
P	0.16	<0.01	<0.01	<0.01	<0.01	0.05	0.30

^aEstimates exclude harvest on shooting preserves.

^bPearson product-moment correlation coefficient.

Table 4. Number of hunters, by species, 1983-99, Pennsylvania.

Year	Spring turkey	Fall turkey	Rabbits	Grouse	Squirrel	Pheasant ^a	Woodcock
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1983	255,982	367,657	738,970	471,640	614,324		148,887
1984	209,717	322,347	626,892	419,367	525,670		120,643
1985	214,331	298,055	619,220	423,393	528,599		100,270
1986	246,039	336,225	612,424	442,897	552,336		110,886
1987	206,039	282,761	516,281	374,741	472,250		96,936
1988	226,008	300,055	528,615	390,192	472,841		93,110
1989	224,138	296,139	497,463	365,211	464,434		87,053
1990	191,442	234,911	436,961	299,534	369,848	274,957	30,045
1991	179,202	252,210	405,004	292,418	348,868	254,051	24,681
1992	186,738	212,104	373,800	254,724	329,726	217,189	25,916
1993	201,060	222,780	347,129	242,398	311,103	198,657	23,452
1994	224,405	244,095	335,715	259,727	326,271	205,384	19,401
1995	239,521	261,395	297,570	239,014	293,852	182,224	15,702
1996	241,613	250,377	280,351	214,272	279,259	171,275	14,464
1997	233,287	249,934	261,115	197,994	267,051	148,900	13,374
1998	194,819 ^b	199,696 ^b	242,509	183,511	252,738	158,497	12,907
1999	237,984	244,638	221,179	174,576	238,887	142,142	12,212
r ^c	-0.043	-0.808	-0.985	-0.978	-0.970	-0.962	-0.925
P	0.87	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Year	Quail ^a	Dove	Geese	Ducks ^a	Hare	Woodchuck	Crow
1983		188,727	70,019		28,960		
1984		162,779	66,406		27,133		
1985		150,904	62,742		25,141		
1986		166,139	65,087		27,557		
1987		137,402	50,804		19,573		
1988		143,981	53,475		21,873		
1989		131,321	43,603		17,568		
1990	5,378	93,532	33,509	28,443	7,831	123,204	39,579
1991	3,279	86,377	36,032	29,247	7,601	118,257	39,014
1992	1,444	76,998	38,301	29,263	6,156	114,515	34,442
1993	2,657	73,462	41,577	35,782	5,801	109,576	34,648
1994	1,323	74,589	40,106	34,097	7,236	117,251	37,841
1995	1,451	67,754	28,715	30,274	5,949	113,127	36,782
1996	1,184	65,808	31,119	32,434	5,011	101,576	30,087
1997	1,009	60,178	30,574	32,180	3,723	104,561	30,696
1998	1,116	57,579	32,238	34,103	5,506	92,517	31,390
1999	1,550	49,551	33,734	31,503	4,379	90,853	29,131
r ^c	-0.745	-0.959	-0.897	0.468	-0.920	-0.921	-0.858
P	0.01	<0.01	<0.01	0.17	<0.01	<0.01	<0.01

^aEstimates exclude number of hunters on shooting preserves.

^bCautionary note: these low values may have been caused by inadvertently not including the TMA map on the 1998-99 survey instructions. See 1998-99 annual report.

^cPearson product-moment correlation coefficient.

Table 5. Trends of hunter-days, by species, 1990-99, Pennsylvania.

Year	Spring turkey	Fall turkey	Rabbits	Grouse	Squirrel	Pheasant ^a	Woodcock
1990	861,086	872,815	2,901,567	1,764,129	2,345,050	1,287,702	133,947
1991	781,499	851,155	2,474,017	1,580,574	2,004,826	1,115,902	119,238
1992	799,621	696,705	2,210,784	1,331,444	1,814,807	902,308	97,699
1993	843,987	753,896	1,926,331	1,246,856	1,721,261	859,018	94,588
1994	1,003,939	857,959	2,104,454	1,438,808	1,919,013	937,974	73,958
1995	1,084,725	865,565	1,769,363	1,281,923	1,630,631	844,056	62,819
1996	1,103,556	867,072	1,641,774	1,130,129	1,568,102	733,806	51,493
1997	1,019,546	834,253	1,525,740	1,022,603	1,462,230	648,985	48,577
1998	881,026 ^b	691,787 ^b	1,517,673	994,150	1,422,957	775,398	55,343
1999 ^d	1,023,988	807,292	1,268,639	882,167	1,306,098	605,034	47,142
r ^c	0.632	-0.174	-0.959	-0.940	-0.936	-0.907	-0.949
P	0.05	0.63	<0.01	<0.01	<0.01	<0.01	<0.01

Year	Quail ^a	Dove	Geese	Ducks ^a	Hare	Woodchuck	Crow
1990	24,493	475,402	171,436	141,411	15,632	1,228,548	223,525
1991	13,630	409,149	167,342	132,775	15,397	1,341,605	227,527
1992	3,228	329,087	188,303	135,656	11,650	1,191,725	170,185
1993	16,683	326,265	202,644	174,023	11,882	1,338,167	201,412
1994	4,455	340,661	217,021	163,690	15,208	1,294,150	209,854
1995	6,022	295,114	128,611	165,196	11,712	1,253,239	193,952
1996	5,061	280,603	165,523	168,834	9,230	1,246,439	186,781
1997	2,837	237,910	214,269	199,017	6,849	1,241,112	178,724
1998	6,704	261,442	197,118	188,694	11,805	1,359,595	222,980
1999 ^d	5,004	207,743	230,635	189,306	6,864	1,151,067	173,186
r ^c	-0.667	-0.937	0.456	0.889	-0.790	-0.173	-0.427
P	0.04	<0.01	0.19	<0.01	<0.01	0.63	0.22

^aEstimates exclude effort on shooting preserves.

^bCautionary note: these low values may have been caused by inadvertently not including the TMA map on the 1998-99 survey instructions. See 1998-99 annual report.

^cPearson product-moment correlation coefficient.

Table 6. Trends of harvest per 100 hunter-days, by species, 1990-99, Pennsylvania.

Year	Spring turkey	Fall turkey	Rabbits	Grouse	Squirrel	Pheasant ^a	Woodcock
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1990	2.0	2.9	57.6	20.0	87.2	23.5	38.0
1991	2.1	3.8	59.1	18.6	81.4	24.1	44.6
1992	2.3	3.1	67.3	19.1	97.1	29.0	52.5
1993	2.9	4.0	60.3	21.9	92.1	29.1	56.0
1994	2.8	4.6	48.7	21.1	85.2	25.2	40.1
1995	3.4	5.7	57.1	24.6	98.1	29.7	45.6
1996	3.1	4.1	49.2	19.3	92.0	29.4	52.1
1997	3.0	4.5	54.2	18.4	92.5	33.9	49.2
1998	3.7	4.9	60.0	18.5	93.5	27.9	57.1
1999	3.7	5.0	56.4	20.1	94.6	34.9	54.5
r ^b	0.931	0.744	-0.319	-0.072	0.490	0.773	0.589
P	<0.01	0.01	0.37	0.84	0.15	0.01	0.07

Year	Quail ^a	Dove	Geese	Ducks ^a	Hare	Woodchuck	Crow
1990	32.2	215.1	42.5	69.3	23.1	105.8	159.0
1991	22.0	236.7	41.3	65.9	23.2	97.2	113.0
1992	38.3	223.3	41.9	69.1	34.0	97.1	108.8
1993	29.0	225.3	41.6	76.6	17.8	95.2	95.1
1994	65.1	196.5	47.5	78.3	22.0	99.3	117.8
1995	20.0	227.3	50.1	96.8	25.6	97.8	152.6

1996	66.9	214.9	55.3	89.5	17.1	92.3	147.5
1997	62.2	213.0	53.9	94.5	20.9	100.8	103.5
1998	3.6	215.1	66.9	77.4	21.2	88.6	110.8
1999	78.7	249.9	55.7	86.8	35.1	97.1	120.8
r ^b	0.353	0.139	0.878	0.707	0.090	-0.515	-0.161
P	0.32	0.70	<0.01	0.02	0.80	0.13	0.66

^aEstimates exclude effort on shooting preserves.

^bPearson product-moment correlation coefficient.

Table 7. Number of hunters and trappers of furbearers, 1990-99, Pennsylvania.

Year	Raccoon	Muskrat	Red Fox	Gray fox	Opossum	Skunk	Mink	Coyote ^a	Weasel
1990	9,676	4,147	7,941	6,542	3,653	1,914	2,560	7,782	508
1991	9,921	4,865	7,827	6,613	3,915	2,264	2,726	12,184	422
1992	9,525	4,419	7,019	6,263	3,793	2,208	2,539	13,643	452
1993	8,195	4,227	6,790	6,089	3,369	1,967	2,465	14,260	387
1994	7,066	5,570	8,319	7,515	4,267	3,071	3,212	20,597	784
1995	9,718	4,465	8,080	6,908	3,989	2,643	2,879	20,413	853
1996	12,951	6,478	10,007	8,361	6,140	3,443	3,703	21,937	942
1997	13,750	7,363	10,330	8,553	6,386	3,473	4,434	24,526	1,125

1998	12,794	5,900	9,982	8,594	5,558	2,948	3,512	30,016	733
1999 ^d	8,496	3,565	7,834	6,901	3,129	1,969	2,431	29,190	505
r ^b	-0.800 ^c	0.344	0.584	0.665	0.435	0.469	0.477	0.981	0.527
P	<0.01	0.33	0.08	0.04	0.21	0.17	0.16	<0.01	0.12

^aCombines estimates from Game Take Survey and Furtaker Survey.

^bPearson product-moment correlation coefficient.

^cCorrelation coefficient estimated using 1983-99 data.

^dCautionary note: Estimates calculated using correction factor to compensate for combination license bias.

Table 8. Harvest of furbearers, 1983-99, Pennsylvania.

Year	Raccoon	Muskrat	Red fox	Gray fox	Opossum	Skunk	Mink	Coyote ^{a,b}	Weasel ^a
1983	449,499	575,530	88,643	64,754	339,436	86,769	13,089		
1984	495,106	621,111	75,532	66,975	339,294	72,050	23,627		
1985	557,989	362,074	68,074	40,476	237,493	48,847	13,932		
1986	426,625	440,880	95,330	46,387	210,953	39,064	16,008		
1987	443,934	346,558	74,590	56,944	217,552	39,632	18,513		
1988	247,743	230,058	52,778	23,102	105,881	16,371	12,914		
1989	155,761	141,577	43,525	28,818	80,660	20,409	9,669		
1990	116,443	112,358	32,699	21,653	36,574	9,298	7,053	1,810	798
1991	130,608	156,014	28,495	30,409	37,177	8,907	10,355	3,719	481

1992	124,404	135,533	27,611	25,395	27,754	7,221	9,157	4,402	343
1993	118,964	121,657	25,862	23,839	25,807	7,920	7,808	6,161	526
1994	186,551	178,145	30,649	34,691	29,621	12,620	10,208	6,240	723
1995	120,462	130,442	31,110	23,518	29,688	9,995	8,602	6,662	687
1996	214,958	146,013	29,623	23,307	48,549	11,571	9,315	7,957	589
1997	194,696	216,066	36,923	26,043	60,717	12,344	14,063	6,685	1,172
1998	195,110	148,202	47,202	32,922	56,287	11,190	12,238	11,652	662
1999 ^d	107,407	94,215	36,860	26,794	33,723	6,723	13,774	9,586	319
r ^c	-0.767	-0.790	-0.757	-0.704	-0.827	-0.804	-0.459	0.922	0.093
P	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	0.80

^aNo data are available prior to 1990.

^bCombines estimates from the Game Take and Furtaker surveys.

^cPearson product-moment correlation coefficient.

^dCautionary note: Estimates calculated using correction factor to compensate for combination license bias.