

PENNSYLVANIA GAME COMMISSION  
BUREAU OF WILDLIFE MANAGEMENT  
RESEARCH DIVISION  
PROJECT ANNUAL JOB REPORT

PROJECT CODE NO.: 06610

TITLE: Furbearer Research/Management

JOB CODE NO.: 61001

TITLE: Furbearer Population and Harvest Monitoring

PERIOD COVERED: 1 July 2004 to 30 June 2005

COOPERATING AGENCIES: None

WORK LOCATION: Statewide

PREPARED BY: Matthew J. Lovallo

DATE: 27 September 2005

**Abstract:** Information from annual Furtaker Surveys has been used to determine trends in the number of furtakers and furbearer harvests since the early 1990s. Due to budget constraints, the Furtaker Survey was not conducted this year. Consequently, harvest estimates are not available for furbearers except for bobcats. As during previous years, combination license holders were extended furtaking privileges, which resulted in reduced furtaker license sales (24,094 furtaker licenses were sold in 2004). Average pelt values for most furbearers were comparable to last year. Despite increasing pelt value and market demand for wild furs, most furbearer populations in Pennsylvania remain underutilized. Reports of vehicle-caused bobcat mortalities have been steadily increasing and suggest continued numeric and geographic expansion of bobcat populations. Otter populations are expanding throughout the northeast region and some portions of the Susquehanna drainage. Reports of fisher observations suggest that fisher populations are expanding proximal to initial release sites and are naturally expanding into areas of the southcentral and southwest regions.

**OBJECTIVES**

1. To determine trends in the annual harvest of furbearing animals and numbers of trappers.
2. To monitor changes in furbearer population distribution and abundance.

**METHODS**

The annual fur harvest is usually estimated from the Furtaker Survey conducted in March (Rosenberry 2003). Due to budget constraints, this survey was not conducted during 2004. Whereas previous reports have provided harvest information based on furbearer management zones, harvest estimates are now provided based on newly adopted wildlife management units (WMU). Harvest data from previous years is provided for comparison to the most recent estimates (Appendix I). Because combination license holders were extended furtaker privileges during 1999, annual harvest totals for each species were corrected to account for sampling bias during subsequent years. A description of these corrections is provided by Rosenberry (2000).

Average pelt prices of furbearers sold at the Pennsylvania Trapper's Association's (PTA) District fur sales were obtained to monitor trends in pelt value. The PTA members maintained excellent fur sale records and were very cooperative in sharing their database. Pelt values were averaged among several districts reporting fur sale results. Approximately 2% of all furbearers harvested in Pennsylvania are sold at this fur sale. Pelt value trends during 1986-2005 were assessed for each furbearer species.

The reported estimates of coyote harvest include only those animals recorded by furtakers and does not account for the incidental harvest recorded in the Game Take Survey. Combined harvest totals are provided by Rosenberry (2003). Analyses of the beaver harvests results are included in the beaver management plan report.

Annual questionnaires were mailed to all Wildlife Conservation Officers (WCOs) to collect information on annual captures and sightings of otter and fisher and to record numbers and types of coyote damage complaints during the previous calendar year. These surveys were mailed in coordination with annual beaver surveys. Vehicle-caused mortalities and incidental trapping mortalities for bobcat, otter, and fisher were recorded annually by WCOs using standardized kill report forms.

## **RESULTS**

### **Fur Harvest**

As during the last 4 years, combination license holders were extended furtaking privileges, which resulted in reduced furtaker license sales (Table 1). During 1985-2004, furtaker license sales declined steadily ( $r = -0.66$ ,  $P < 0.01$ ) (Table 1). The numbers of furtaker licenses sold has increased by 4% to 7% annually since 1998. Future pelt prices, continued trapping device regulation, and international changes in fur demand will continue to affect the number of furtakers in Pennsylvania. Although harvests have increased for many terrestrial furbearer species, most populations remain underutilized.

In general, the demand and prices paid for furs has declined since historic high values of the early 1980s. Historic low pelt values occurred during the 1989 and 1990 trapping seasons. Fur prices during the 1990s were relatively stable with the lowest values observed during the 1998-1999 season. Average pelt values during 2004-2005 were similar to the previous season; no significant shifts in values were observed (Table 2).

Although harvest estimates are not available for the 2004-2005 harvest season, we have no indication that significant changes in regional harvest levels occurred. The Furtaker Survey will be conducted during March 2006 to obtain harvest estimates. Harvest estimates from the 2003-2004 season are provided as the most recent estimates available for Pennsylvania (Table 3).

### **Population Monitoring**

The number of incidental bobcat captures, as estimated from the annual Furtaker Survey, has been steadily increasing since 1990. Greater than 500 incidental captures have been reported annually since 1995. The 3-year moving average of incidental captures has increased significantly during 1990-2003 ( $r = 0.81$ ,  $P < 0.01$ ) (Table 4). Because the number of incidental captures is estimated from the Furtakers Survey, no estimate is available for the previous year. Annual numbers of statewide vehicle-caused bobcat mortalities (i.e., roadkills) have also increased significantly; the greatest number of vehicle-caused bobcat mortalities ( $N = 119$ ) was recorded during 2000 (Table 5). These indices suggest continued numeric and geographic expansion of bobcat counties. The greatest

numbers of vehicle-caused mortalities have been reported from high-density populations in the northcentral and southwestern counties.

Since 2001, the Pennsylvania Game Commission (PGC) included questions concerning bobcat sightings on the annual Game Take Survey, which is sent to approximately 2% of general hunting license buyers each year (Rosenberry 2001). An annual sighting index (number of observations divided by effort \* 100) has been developed to detect changes in observation rates (Table 6). Several years of data will be required to detect changes in observation rates for these species. Because this survey was not conducted during 2004, estimates of bobcat sightings were not available.

The annual number of fisher observations reported to WCOs has been increasing since fishers were reintroduced in 1996, whereas the number of reported incidental captures has been less than 10 during all years (Table 7). WCOs received 31 reports of fishers that were captured and released by licensed trappers and 303 reports of fisher observations. The geographic distribution of these reports suggests that fisher populations are slowly expanding from the reintroduction areas in northern regions and are naturally expanding into regions of southwestern and southcentral Pennsylvania.

Numbers of incidental otter captures, primarily by beaver trappers, have also increased during recent years with greater than 25 incidental captures reported annually since 1995 (Table 7). The majority of these captures occur in the Northeast Region, but recent reports indicate continued population expansion throughout the Susquehanna drainage. Since 2000, the annual hunting and trapping digest has provided trappers with additional information regarding the avoidance of otter while trapping beaver. Preliminary reports from WCOs indicate that trappers in high-density otter areas are using these techniques to avoid otter captures. Despite these efforts, during the 2003-2004 we observed the highest number of incidental captures reported (i.e., 42 otters) since 1994. As otter populations continue to expand, more intensive monitoring will be required.

Reports of coyote-caused damage to livestock and domestic pets have been relatively stable since 1993. During this past year the PGC received increased numbers of complaints and losses due to coyotes. Complaints related to concerns for human safety have increased significantly. Sheep and poultry operations continue to report the greatest losses annually (Table 8). Reports of coyotes killing domestic dogs and cats are increasing, particularly in the southwest and southeast regions. The number of WCOs receiving coyote complaints has been steadily increasing during recent years; 64 districts reported complaints during the most recent survey period. The majority of coyote complaints received by WCOs are people expressing concern for pets, livestock, wildlife, or human safety issues.

#### **RECOMMENDATIONS**

1. The fur harvest should continue to be reported by species and wildlife management unit to monitor area-specific harvest trends. Pelt price information should also be collected annually to monitor trends in fur value relative to regional harvest trends.

2. Current methods for monitoring changes in density and distribution of bobcat, otter, and fisher should be continued, and for otter, intensified to better understand population trends.

3. The Game Take Survey should continue to query general license buyers regarding bobcat, fisher, and coyote observations.

4. The PGC should continue educational efforts concerning techniques for avoiding otter captures.

5. Increased numbers of coyote-related complaints should be addressed through educational programs in rural and suburban communities.

**LITERATURE CITED**

Rosenberry, C. S. 2000. Game Take and Furtaker Surveys. Annual Job Report 11101. Pennsylvania Game Commission. Harrisburg, Pennsylvania, USA.

Rosenberry, C. S. 2003. Game Take and Furtaker Surveys. Annual Job Report 11101. Pennsylvania Game Commission. Harrisburg, Pennsylvania, USA.

Table 1. Number of furtaker licenses sold in Pennsylvania.

Year	Licenses sold
1985	64,000
1986	44,087
1987	42,000
1988	36,000
1989	29,000
1990	20,377
1991	20,251
1992	20,345
1993	19,458
1994	22,376
1995	21,376
1996	25,636
1997	27,413
1998	25,877
1999	17,591
2000	18,551
2001	19,410
2002	20,676
2003	22,454
2004	24,094

Table 2. Average pelt prices in dollars of furbearers sold at the annual Pennsylvania Trapper's Association District fur sales. Sample sizes are in parentheses.

Season	Red Fox		Gray Fox		Raccoon		Muskrat		Opossum	
1991-1992	13.55	(150)	12.78	(565)	7.12	(743)	2.95	(6,487)	2.17	(273)
1992-1993	12.96	(217)	11.32	(662)	6.77	(813)	2.25	(4,789)	1.71	(279)
1993-1994	15.44	(204)	11.02	(643)	8.54	(948)	2.88	(4,817)	1.88	(260)
1994-1995	18.73	(514)	11.47	(1,699)	9.15	(1,801)	3.09	(7,827)	1.51	(204)
1995-1996	16.30	(401)	9.40	(1,218)	10.27	(1,314)	3.15	(3,911)	1.74	(283)
1996-1997	18.05	(512)	11.94	(1,117)	15.34	(2,031)	6.03	(4,473)	1.83	(488)
1997-1998	13.18	(321)	9.65	(803)	12.07	(1,622)	3.44	(7,006)	1.41	(423)
1998-1999	9.73	(259)	4.84	(738)	6.87	(1,361)	1.87	(6,261)	0.49	(83)
1999-2000	10.72	(334)	6.19	(764)	4.94	(930)	3.16	(3,045)	1.47	(28)
2000-2001	16.58	(405)	8.61	(573)	7.42	(848)	3.40	(2,498)	2.47	(35)
2001-2002	20.14	(499)	10.05	(316)	8.34	(1,689)	3.85	(4,035)	1.54	(27)
2002-2003	22.84	(401)	12.81	(362)	9.39	(973)	3.81	(2,039)	2.12	(90)
2003-2004	19.92	(371)	18.74	(233)	10.15	(1,004)	3.33	(2,042)	2.03	(105)
2004-2005	16.48	(1,970)	18.04	(218)	10.11	(2,990)	2.89	(3,262)	2.51	(632)

Table 2 (cont). Average pelt prices in dollars of furbearers sold at the annual Pennsylvania Trapper's Association District 9 fur sales. Sample sizes are in parentheses.

Season	Skunk		Mink		Coyote		Beaver	
1991-1992	N.S. <sup>a</sup>		26.23	(721)	18.37	(22)	13.14	(548)
1992-1993	N.S.		19.95	(722)	25.40	(38)	10.63	(628)
1993-1994	2.66	(6)	18.35	(616)	24.15	(41)	19.03	(333)
1994-1995	2.21	(19)	14.08	(930)	24.70	(75)	19.94	(1,230)
1995-1996	3.00	(8)	11.88	(898)	13.36	(57)	19.65	(594)
1996-1997	3.92	(37)	19.06	(754)	20.68	(94)	29.37	(1,138)
1997-1998	N.S.		11.66	(904)	9.72	(57)	21.73	(1,386)
1998-1999	N.S.		9.48	(493)	6.40	(48)	15.29	(517)
1999-2000	N.S.		9.75	(483)	15.43	(76)	16.08	(667)
2000-2001	N.S.		9.64	(369)	16.07	(125)	20.00	(376)
2001-2002	N.S.		8.47	(459)	17.16	(137)	15.86	(448)
2002-2003	N.S.		9.69	(250)	22.57	(115)	14.33	(248)
2003-2004	N.S.		10.50	(146)	25.29	(101)	15.84	(351)
2004-2005	3.14	(65)	12.84	(270)	9.37	(19)	16.11	(55)

<sup>a</sup>N.S. = No Sale

Table 3. Estimated harvests of furbearers during the 2003-2004 hunting and trapping seasons.

WMU	Raccoon	Red Fox	Gray Fox	Coyote	Muskrat	Mink	Skunk	Opossum	Weasels
1A	9,431	390	101	332	8,372	201	231	2,977	11
1B	3,154	195	30	312	3,628	151	30	719	0
2A	3,062	667	222	111	1,920	30	191	1,134	11
2B	7,048	647	788	111	1,930	70	1,932	1,610	0
2C	5,825	842	1,353	91	3,025	161	91	1,752	11
2D	8,024	637	949	111	3,658	131	382	1,711	0
2E	2,836	236	1,283	101	2,302	131	191	932	11
2F	4,479	595	515	211	1,156	151	564	1,691	0
2G	3,452	287	1,394	604	693	161	262	1,256	0
3A	1,510	421	192	292	1,206	161	342	1,256	0
3B	2,116	390	667	362	1,487	101	161	324	0
3C	1,469	421	313	211	2,482	252	221	385	11
3D	678	493	141	292	352	101	181	496	0
4A	1,870	380	1,040	91	603	91	161	334	0
4B	2,692	989	818	111	2,603	242	231	992	0
4C	3,010	1,304	273	151	1,327	675	292	1,073	11
4D	4,346	873	1,555	181	2,553	413	372	1,205	74
4E	2,291	1,099	848	392	4,543	302	322	1,620	32
5A	2,743	3,439	677	60	2,714	272	433	1,580	0
5B	6,750	4,353	414	70	6,955	1,218	684	2,916	42
5C	3,062	3,573	71	141	884	151	111	597	0
5D	442	257	0	0	20	0	10	51	0
Unknown	24,492	9,107	2,313	1,167	16,955	1,329	1,922	7,149	148
<b>Total</b>	<b>104,781</b>	<b>31,592</b>	<b>15,956</b>	<b>5,504</b>	<b>71,368</b>	<b>6,494</b>	<b>9,319</b>	<b>33,760</b>	<b>359</b>

Table 4. Numbers of incidental bobcat captures as estimated from the annual Furtaker Survey. Furtaker Survey was not conducted during 2004-2005.

Trapping	No. Survey Respondents	No. Furtaker Licenses	No. Bobcats <sup>a</sup> Captured and Released	Extrapolated No. Bobcat Captures	3-year moving Average <sup>b</sup> (No. Bobcat Captures)
1990-1991	2,302	20,377	40	354	
1991-1992	2,361	20,215	24	205	293
1992-1993	1,652	20,345	26	320	222
1993-1994	2,175	19,246	16	142	513
1994-1995	2,056	21,905	101	1076	559
1995-1996	2,181	21,840	46	460	736
1996-1997	2,363	25,636	62	673	566
1997-1998	2,233	27,413	46	565	790
1998-1999	2,466	25,877	108	1133	797
1999-2000	1,557	17,414	62	693	991
2000-2001	1,681	18,551	52	574	656
2001-2002	1,553	19,410	56	700	599
2002-2003	1,779	20,676	45	523	639
2003-2004	2,204	22,454	68	693	<sup>c</sup>

<sup>a</sup> Does not include bobcats legally harvested by permit holders.

<sup>b</sup>  $r = 0.64, P < 0.05$

<sup>c</sup> Furtaker Survey was not conducted during 2004-2005.



Table 5. Numbers and geographic distribution of vehicle-caused bobcat mortalities during 1985-2004.

Year	No. Reported Bobcat Roadkills	No. Counties with Roadkills	No. New County Records	3-Year Moving Average
1985	2	2	0	
1986	15	2	7	12.0
1987	19	8	3	15.3
1988	12	5	4	15.7
1989	16	6	1	18.7
1990	28	7	5	26.3
1991	35	11	1	34.0
1992	39	13	5	44.0
1993	58	19	1	42.7
1994	31	14	1	48.7
1995	57	17	2	45.7
1996	49	15	0	59.0
1997	71	19	5	59.0
1998	57	18	3	71.3
1999	86	24	3	87.3
2000	119	29	3	102.7
2001	103	28	0	109.7
2002	107	28	0	107.0
2003	111	27	0	108.7
2004	108	27	0	

Table 6. Reports of bobcat and fisher sightings by county from the annual Game Take Survey, 2001-2003.

Year	Season	N (%)	Effort days	Bobcats			Fishers		
				No. observed	No. counties	SI <sup>a</sup>	No. observed	No. counties	SI <sup>a</sup>
2001	Spring Gobbler Hunters	2,785 (24.8)	12,735	200	38	1.57	90	17	0.71
	Firearms Deer Hunters	8,628 (76.9)	40,254	585	56	1.45	152	38	0.38
	Archery Deer Hunters	3,237 (28.8)	36,439	407	54	1.12	134	37	0.37
	All Hunters	11,221 (100.0)	89,428	1,192	63	1.33	376	42	0.42
2002	Spring Gobbler Hunters	2,423 (24.8)	10,952	205	37	1.87	43	19	0.39
	Firearms Deer Hunters	7,176 (73.3)	33,412	465	57	1.39	170	38	0.51
	Archery Deer Hunters	2,816 (28.8)	31,396	266	49	0.85	95	29	0.30
	All Hunters	9,777 (100.0)	75,760	936	61	1.24	308	43	0.41
2003 <sup>b</sup>	Spring Gobbler Hunters	2,728 (27.3)	12,147	131		1.08	49		0.40
	Firearms Deer Hunters	7,388 (73.8)	34,133	367		1.08	95		0.28
	Archery Deer Hunters	2,923 (29.2)	27,137	265		0.97	63		0.23
	All Hunters	10,005 (100.0)	73,417	763		1.04	207		0.28

<sup>a</sup> SI = Sighting Index = Observations/Effort \* 100

<sup>b</sup> Sighting are reported by WMU, not county beginning in 2003.

Table 7. Reports of otter and fisher captures and fisher observations estimated from annual questionnaires of WCOs, 1994-2004.

Survey Season	No. Districts Reporting	No. Incidental Otter Captures	No. Incidental Fisher Captures	No. Reported Fisher Observations
1995	123	15		
1996	123	15		
1997	123	31	10	60
1998	123	26	9	67
1999	127	30	6	94
2000	123	35	8	82
2001	137	25	6	105
2002	122	27	9	106
2003	133	26	20	206
2004	122	42	31	303

Table 8. Types and numbers of coyote-related complaints reported to WCOs, 1993-2004.

Survey Results	Survey Period									
	1914	1996	1997	1998	1999	2000	2001	2002	2003	2004
No. districts with complaints	42	44	60	47	63	61	58	58	58	64
Nature of Complaints										
Concern for Cattle	8	19	27	8	12	11	11	11	11	16
Concern for Sheep	37	24	43	22	23	26	17	15	30	23
Concern for Goats	3	5	8	3	4	1	1	1	4	3
Concern for Poultry	16	5	13	12	17	14	15	15	15	25
Concern for Dogs	7	9	17	12	11	22	12	12	10	19
Concern for Cats	13	7	15	19	13	29	23	22	24	77
Afraid of Coyotes	71	86	114	69	114	126	114	115	98	316
Concern for Deer	89	52	41	49	47	57	29	28	50	87
Concern for Turkeys	23	13	10	14	10	18	6	5	13	37
Other	4	1	15	31	0	0	7	8	26	0
Total	271	221	303	239	251	304	235	232	281	603
Coyote-caused Mortalities										
Cows	0	3	1	0	0	1	0	0	0	0
Calves	2	8	9	3	7	8	5	5	4	13
Sheep	82	100	251	60	81	91	21	21	31	37
Goats	3	0	9	6	3	0	1	1	6	0
Poultry	112	27	51	43	52	44	49	48	66	85
Dogs	0	6	6	3	6	17	5	6	3	4
Cats	24	11	14	14	5	30	21	21	14	73
Rabbits	12	9	4	2	2	3	2	2	8	5
Deer		10	3	5	5	9	10	10	12	17
Other	17	1	0	0	3	3	0	0	0	2
Total	252	175	348	136	164	206	114	114	140	236

Appendix 1. Furtaker harvest by prior furbearer management zones in Pennsylvania during 1991-2002.

Species	Year	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Unknown	Total
Red Fox	1991	1,839	2,989	1,012	5,742	3,116	13,499	298	28,495
	1992	1,449	2,207	1,560	5,548	3,461	13,050	336	27,611
	1993	945	2,140	1,347	2,790	3,420	14,981	239	25,862
	1994	3,339	2,583	2,124	6,061	3,642	12,450	450	30,649
	1995	1,320	2,479	1,796	4,672	2,975	17,089	779	31,110
	1996	1,887	2,367	1,450	4,814	3,315	15,263	527	29,623
	1997	1,666	2,624	1,208	6,716	5,330	19,115	264	36,923
	1998	886	3,198	1,167	9,044	3,387	28,655	865	47,202
	1999	1,795	2,069	1,635	5,580	2,974	18,705	4,102	36,860
	2000	843	2,398	1,497	8,708	2,638	16,263	713	33,060
	2001	2,059	873	2,172	6,026	4,062	17,419	392	33,003
	2002	887	2,596	2,581	5,753	1,804	19,001	385	33,007
	$r^a$	-0.26	-0.32	0.52	0.44	-0.22	0.52		
$P$	0.40	0.31	0.08	0.15	0.49	0.08			0.08
Gray Fox	1991	390	8,776	2,445	4,850	9,870	3,412	666	30,409
	1992	644	4,269	4,675	3,766	9,015	2,494	532	25,395
	1993	497	6,628	2,954	3,769	5,452	4,098	441	23,839
	1994	857	9,007	6,356	6,098	6,645	2,704	1720	33,387
	1995	530	5,607	5,159	3,862	4,681	3,194	485	23,518
	1996	417	5,755	4,496	3,391	4,912	3,454	882	23,307
	1997	421	5,578	4,175	3,790	8,303	3,655	121	26,043
	1998	512	9,295	5,346	7,967	5,791	3,163	848	32,922
	1999	468	4,982	6,312	6,301	4,427	3,852	453	26,794
	2000	477	6,593	2,712	4,525	5,674	3,503	968	24,452
	2001	337	2,567	2,988	6,494	6,114	4,352	423	23,275
	2002	397	3,974	2,733	5,989	2,945	2,367	400	18,805
	$r$	-0.44	-0.47	-0.28	0.48	-0.66	0.14		
$P$	0.16	0.13	0.38	0.11	0.02	0.66			0.17
Coyote <sup>b</sup>	1991	83	333	268	83	175	50	590	1,582
	1992	96	564	384	108	324	192	12	1,680
	1993	260	531	524	350	287	97	43	2,092
	1994	238	516	1,109	454	269	81	31	2,698
	1995	177	1,881	443	356	218	90	8	3,173
	1996	590	1,233	1,052	461	677	119	61	4,193
	1997	252	746	625	552	671	228	92	3,166
	1998	939	1,561	845	1,072	796	334	31	5,578
	1999	1,392	961	683	436	638	260	87	4,456
	2000	1,469	1,450	616	1,634	481	225	36	5,910
	2001	1,179	841	1,363	961	918	461	200	5,923
	2002	781	1,540	1,495	1,092	798	534	44	6,284
	$r$	0.82	0.57	0.69	0.82	0.83	0.85		
$P$	<0.01	0.05	0.01	<0.01	<0.01	<0.01			<0.01

Appendix 1.(cont). Furtaker harvest by management zone in Pennsylvania during 1991-2002.

Species	Year	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Unknown	Total
Raccoon	1991	26,131	12,624	6,971	41,680	12,176	17,499	13,521	130,608
	1992	35,418	10,829	6,545	34,717	12,617	15,636	3,640	124,404
	1993	26,162	15,302	4,247	37,234	14,168	14,239	7,612	118,964
	1994	56,098	21,791	12,040	54,444	17,411	17,705	7,062	186,551
	1995	31,642	10,201	7,129	38,366	11,643	18,170	3,311	120,462
	1996	53,765	14,667	8,435	84,479	17,535	26,519	9,558	214,958
	1997	48,292	19,376	10,247	64,423	26,339	20,674	5,345	194,696
	1998	36,600	22,783	9,683	76,925	20,716	23,399	5,004	195,110
	1999	18,785	12,525	8,073	38,729	12,403	15,451	1,442	107,407
	2000	15,341	11,013	6,356	41,040	10,331	23,070	1,739	108,890
	2001	25,060	12,424	7,029	44,710	12,586	18,370	1,631	121,810
	2002	25,881	9,086	4,325	39,464	10,400	15,793	1,510	106,485
		$r^a$	-0.33	-0.16	-0.11	0.08	-0.09	0.22	
	$P$	0.29	0.62	0.73	0.80	0.77	0.49		0.60
Opossum	1991	6,204	4,093	2,915	6,781	7,671	8,929	584	37,177
	1992	5,644	3,369	1,631	5,011	5,009	6,857	233	27,754
	1993	3,087	3,555	3,013	5,487	5,060	5,390	215	25,807
	1994	4,228	3,612	3,316	5,997	4,978	6,729	761	29,621
	1995	4,998	2,573	2,942	6,358	4,424	7,228	1165	29,688
	1996	7,012	6,064	4,553	12,217	6,423	11,458	822	48,549
	1997	6,512	7,612	8,063	13,867	12,205	11,838	620	60,717
	1998	6,689	11,338	6,137	12,649	8,604	10,264	606	56,287
	1999	1,441	4,734	2,948	13,976	3,919	6,543	162	33,723
	2000	980	5,051	1,608	9,972	3,522	7,450	510	29,093
	2001	2,016	2,273	2,946	6,395	5,695	7,015	852	27,192
	2002	4,005	4,354	4,051	9,197	5,350	7,201	629	34,787
		$r$	-0.48	0.19	-0.01	0.48	-0.09	0.03	
	$P$	0.11	0.56	0.99	0.11	0.78	0.92		0.73
Skunk	1991	634	1,569	403	1,225	1,697	3,179	200	8,907
	1992	443	1,218	123	1,254	1,356	2,763	64	7,221
	1993	608	1,314	1,444	968	1,454	1,937	195	7,920
	1994	1,091	1,781	1,573	2,213	1,886	3,892	184	12,620
	1995	1,120	1,390	720	1,410	1,430	3,720	205	9,995
	1996	958	1,704	1,141	1,455	2,000	4,176	137	11,571
	1997	867	1,662	1,281	2,296	3,003	3,124	111	12,344
	1998	940	2,197	1,157	1,427	2,134	3,110	225	11,190
	1999	42	1,178	1,085	1,110	1,032	2,103	172	6,723
	2000	280	1,272	584	1,939	1,134	2,173	152	7,534
	2001	682	442	1,009	1,770	2,676	5,586	79	9,245
	2002	274	1391	701	1,997	1,718	1,038	89	7,207
		$r$	-0.36	-0.29	0.12	0.44	0.19	-0.09	
	$P$	0.25	0.36	0.70	0.16	0.57	0.79		0.60

Appendix 1 (cont). Furtaker harvest by management zone in Pennsylvania during 1991-2002.

Species	Year	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Unknown	Total
Mink	1991	1,202	2,482	1,691	983	2,396	1,143	458	10,355
	1992	834	906	1,406	2,405	2,453	1,142	11	9,157
	1993	657	2,235	1,288	886	1,795	823	124	7,808
	1994	1,556	2,091	2,101	950	1,536	1,681	293	10,208
	1995	889	1,219	1,675	1,199	2,016	1,438	166	8,602
	1996	1,667	957	1,754	1,002	1,768	2,066	101	9,315
	1997	1,942	1,492	3,262	1,443	4,015	1,797	112	14,063
	1998	903	2,400	2,937	1,359	2,708	1,672	259	12,238
	1999	813	1,356	5,287	1,912	1,657	2,749	0	13,774
	2000	1,159	1,292	830	1,013	1,709	2,269	342	8,614
	2001	3,194	1,810	1,662	783	3,282	2,300	184	13,214
	2002	1,551	933	704	2,457	1,334	2,960	129	10,069
	$r^a$	0.45	-0.33	0.09	-0.18	0.01	0.88		0.42
$P$	0.14	0.30	0.77	0.58	0.99	<0.01		0.17	
Muskrat	1991	26,817	18,896	12,674	26,108	35,548	33,285	2,686	156,014
	1992	28,081	14,925	11,214	20,949	37,105	22,647	612	135,533
	1993	18,296	20,680	14,174	19,281	28,837	19,192	1,197	121,657
	1994	31,922	24,647	19,011	36,109	30,610	31,049	4,797	178,145
	1995	22,086	6,581	11,601	24,551	25,199	35,157	5,267	130,442
	1996	35,999	12,066	9,767	39,072	19,858	26,705	2,546	146,013
	1997	57,034	23,065	22,064	41,557	35,928	33,861	2,557	216,066
	1998	20,109	17,166	13,579	37,691	32,501	23,921	3,238	148,205
	1999	11,314	7,386	12,326	24,033	21,309	17,378	469	94,215
	2000	12,362	6,417	6,779	20,768	14,228	16,873	2,453	79,880
	2001	30,241	10,592	12,139	22,112	25,597	20,613	699	121,994
	2002	12,837	4,346	4,730	26,461	18,340	8,320	306	75,340
	$r$	-0.26	-0.62	-0.39	0.01	-0.67	-0.62		-0.50
$P$	0.42	0.03	0.21	0.98	0.02	0.03		0.10	

<sup>a</sup> Pearson product-moment correlation coefficient ( $r$ ) and probability ( $P$ ).

<sup>b</sup> Coyote take does not include harvest from Game Take Survey.