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TITLE: Furbearer Population and Harvest Monitoring

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ABSTRACT Information from annual Furtaker Surveys has been used to determine trends in the number of furtakers and furbearer harvests since 1990. Furtaker license sales have increased steadily since 1999. During the 2013-2014 harvest season, 44,589 furtaker licenses were sold, the highest number recorded since 1985. The estimated statewide furtaker harvest decreased for raccoons, red foxes, gray foxes, coyotes, muskrats, mink, opossums, and weasels. Only beavers and striped skunks showed harvest increases. Average pelt values decreased for all furbearer species except for coyotes, skunks, opossums, and bobcats. Modest pelt price changes ranged from a 27% increase for opossum pelts to a 24% decrease for mink. Reports of bobcat sightings and incidental bobcat captures were comparable to previous years suggesting stabilization or slight declines in bobcat populations. Reports of fisher observations were similar to the previous year and continue to suggest that fisher populations are expanding rapidly proximal to initial release sites and throughout areas of the southcentral, southwest, and central regions. Otter populations expanded throughout the state. In 2013, river otters occupied 89% of Wildlife Conservation Officer (WCO) districts. Coyote complaints and damage to livestock remained stable. Beaver damage and nuisance complaints were also stable. With 79% of WCO districts reporting increasing or stable populations, the overall status of beavers appears secure in most areas. Nuisance raccoon, skunk, and fox complaints remained most common among WCOs during 2013. WCOs provided information on dead porcupines found along highways and reported none or less than one per month in 51% of WCO districts. Some officers (24%) reported seeing 1 or more dead porcupines per week.

OBJECTIVES

1. Determine trends in the annual harvest of furbearing animals and numbers of trappers.
2. Monitor changes in furbearer population distribution and abundance.

METHODS

Fur Harvest

The annual fur harvest was estimated from the Furtaker Survey conducted each April. Due to budget constraints, this survey was not conducted during 2004, but has been implemented in subsequent years. Harvest estimates were presented by species and Wildlife Management Unit (WMU). Combination license holders have been extended furtaker privileges since 1999, but harvest totals for each species did not include them during 1999-2010, representing a sampling bias (Boyd and Weaver 2010). Beginning with the 2011-12 season, junior combination license holders were included in calculating harvest totals. The fur harvest success of both junior and senior combination license holders were included in harvest estimates beginning in 2012 (Johnson et al. 2012).

Average pelt prices of furbearers sold at the Pennsylvania Trappers Association's District fur sales were obtained to monitor trends in pelt value. Pelt values were averaged each year among several districts reporting fur sale results. Approximately 5% of all furbearers harvested in Pennsylvania were sold at these fur sales. Pelt value trends during 1986-2013 were assessed for each furbearer species.

The reported estimates of coyote harvest included only those animals recorded by furtakers and does not account for the incidental harvest recorded in the Game Take Survey. (Johnson et al. 2012) provided the combined harvest totals.

Wildlife Conservation Officer Furbearer Questionnaire

Questionnaires were mailed annually to all Wildlife Conservation Officers (WCOs) to collect a variety of furbearer information. Accidental captures and sightings of otter and fisher and numbers and types of coyote damage complaints during the previous calendar year were reported by WCOs via this survey. Numbers of beaver complaints received and assessments of beaver, otter, fisher, bobcat, and porcupine populations were also queried. In an effort to monitor the frequency of nuisance complaints of other furbearers, WCOs were asked to record numbers of bobcat, fisher, fox, weasel, river otter, mink, muskrat, raccoon, opossum, and skunk complaints. The 2013-2014 WCO Furbearer Questionnaire (Fig. 1) was distributed electronically on 12 May 2014. Survey data were scheduled for return from the Regional Wildlife Management Supervisors on 13 June 2014.

Although not considered a furbearer in Pennsylvania, porcupine status and distribution was assessed using the WCO Furbearer Questionnaire. Interest in monitoring porcupine populations stemmed from the 2011 regulation change allowing limited take of this species. Pre- and post-harvest population assessments were valuable in harvest management for this species. Porcupine mortality along highways was measured by asking WCOs to categorize highway accident and shooting frequency within their districts.

Vehicle-caused mortalities and incidental trapping mortalities for bobcat, otter, and fisher were recorded annually by WCOs using standardized kill report forms. Mandatory WCO reporting of these mortalities was a year-round activity.

RESULTS

Fur Harvest

In 1985 a furtaker license was created, and since then furtaker license sales have generally declined ($r = -0.068$, $P < 0.05$) (Table 1). Since 1999, combination license holders were extended furtaking privileges, which resulted in reduced furtaker license sales. However, the numbers of furtaker licenses sold increased steadily since 1999 (Table 1). During the 2013-2014 harvest season, 44,589 furtaker licenses were sold, the highest number recorded since 1985. Junior and senior combination license holders numbered 112,838. Variable pelt values, continued trapping device regulation, and international changes in fur demand will continue to affect the number of furtakers in Pennsylvania.

The estimated statewide furtaker harvest decreased for raccoons, red foxes, gray foxes, coyotes, muskrats, mink, opossums, and weasels (Table 2). Only beavers and striped skunks showed harvest increases. Three-year average harvests of raccoon, muskrat, beaver, and opossum increased by $>10\%$ (Table 2). Species harvest totals by WMU were provided for regional comparison of relative species abundance and harvest intensity (Table 3).

During December 2010, the Pennsylvania Game Commission (PGC) implemented its first regulated fisher trapping season. This season was limited to 4 WMUs, 2C, 2D, 2E, and 2F. Furtakers were required to purchase a fisher permit prior to participating in the season and to report their harvest within 48 hours of trapping a fisher. Areas where fisher trapping was allowed expanded in 2012 with the addition of WMUs 2G and 4D, and again in 2013 with the addition of WMUs 2H, 3A, 3D, and 4E. During 2013, 5,559 fisher permits were purchased and 341 harvest reports were received. The harvest totals by WMU were 67 fisher from 2C, 37 from 2D, 40 from 2E, 60 from 2F, 2 from 2H, 18 from 2G, 12 from 3A, 27 from 4D, 50 from 4E, and 28 from 3D.

The demand and prices paid for furs recently increased to 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 decreased for all furbearer species during 2013-2014 except coyotes, skunks, opossums, and bobcats (Table 4). Modest pelt price changes ranged from a 27% increase for opossum pelts to a 24% decrease for mink.

Population Monitoring

Bobcats.--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 1990-2013 ($r = 0.90$, $P < 0.05$) (Table 5). The number of incidental bobcat captures during 2013 was comparable to the previous 2 years.

Since 2001, the 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 (Boyd and Weaver 2010). An annual sighting index (number of observations divided by effort \times 100) has been developed to detect changes in observation rates (Table 6). Recent inconsistencies

in methods used to calculate effort for this index will result in a review of the methodology used. No index was calculated for 2009-2013.

Based on results from the WCO furbearer questionnaire, bobcat populations continue to be well established. WCOs reported increasing or stable bobcat populations in 73% of districts (Fig. 2). Bobcats were absent in 20% of WCO districts in 1995, but were absent in only 9% of districts during 2013.

Fishers.--The number of incidental fisher captures reported on the furtakers survey has been increasing steadily during the past decade (Table 7). We estimate that 1,257 fishers were captured and released by Pennsylvania trappers during the 2013-2014 season. The annual number of fisher observations and incidental captures reported to WCOs continued to trend upward since fishers were reintroduced in 1996 (Table 8). WCOs received 94 reports of fishers that were captured and released by licensed trappers and 999 reports of fisher observations. The geographic distribution of these reports suggests that fisher populations continue to rapidly expand from the reintroduction areas in northern regions and naturally expanding into regions of southwestern and southeastern Pennsylvania. In addition, 89% of WCOs surveyed during 2013 reported fisher populations existing within their districts, as compared to only 65% in 2004 (Fig. 3).

River Otters.--River otter populations have expanded throughout the commonwealth. Numbers of incidental otter captures, primarily by beaver trappers, have increased during recent years with greater than 25 incidental captures reported annually since 1996 (Table 8). The majority of these captures occur in the Northeast Region, but recent reports indicate continued population expansion throughout the Susquehanna River drainage. Based on results of the 1995 WCO furbearer questionnaire, otters occurred in 49% of WCO districts. In 2013, otters occupied 89% of WCO districts (Fig. 4). We estimate that 129 river otters were captured and released by Pennsylvania trappers during the 2013-2014 season.

Since 2000, the annual hunting and trapping digest has provided trappers with additional information regarding the avoidance of otter while trapping beavers. Preliminary reports from WCOs indicate that trappers in high-density otter areas were using these techniques to avoid otter captures. Incidental otter capture reports totaled 45 during the 2013-14 trapping season. The average number of incidental otter captures during the previous 5 years was 49.

Coyotes.--Reports of coyote-caused damage to livestock and domestic pets have been relatively stable since 1993. Numbers of complaints and losses due to coyotes during 2013 were similar to reports from previous years. Complaints related to concerns for human safety were most common (56% of all complaints). Losses of calves, sheep and poultry are stable (Table 9). Reports of coyotes killing domestic dogs and cats are increasing, particularly in the Southwest and Southeast regions. WCOs in 77 districts (58%) reported complaints during the most recent survey period. The majority of coyote complaints received by WCOs are people expressing concern primarily for human safety, but also for pets, livestock, and wildlife.

Beavers.--The overall status of beaver populations appears secure in most areas, with 79% of WCO districts reporting increasing or stable populations in 2013 (Fig. 5). WCOs

observed decreases in established populations within 8% of districts. Poorly-established populations comprised 12% of WCO districts during 2013. One WCO in Berks County reported beavers were absent within his district. On a statewide basis, little change occurred to beaver populations from 2007 to 2013 (Fig. 5). Areas of suitable habitat with decreasing or non-established beaver populations may need trapping regulation changes to allow for population growth and expansion.

In 2013, beaver damage and nuisance complaints remained relatively low. Since 1996, when beaver complaints peaked at 1,140, reports of problem beavers gradually decreased. WCOs received 488 beaver complaints during 2013-2014. Although the northwest and northeast corners of Pennsylvania have always been beaver nuisance hotspots, WCOs reported a more scattered distribution of complaints (Fig. 6). Beaver complaints have become more common in southeastern Pennsylvania. As the human population grows and beaver populations expand into more urban areas, the public may be less tolerant of beaver activity.

Other furbearers.--WCOs recorded the number of nuisance complaints received involving furbearer species other than coyotes and beavers. Raccoon, skunk, and fox complaints remained most common during 2013 (Table 10). Overall, furbearer complaint levels remained relatively stable. We will continue to monitor nuisance complaint levels of these furbearers in subsequent years.

Porcupines.--WCO survey responses established baseline information on porcupine population status and distribution. Porcupines were absent from the southwestern and southeastern portions of Pennsylvania (Fig. 7). Officers responded to 73 nuisance porcupine complaints. No porcupines or less than 1 per month were found dead along highways in 51% of WCO districts (Fig. 8). Some officers (24%) reported seeing 1 or more dead porcupines per week.

RECOMMENDATIONS

1. The fur harvest should continue to be reported by species and WMU to monitor area-specific harvest trends.
2. Pelt price information should be collected annually to monitor trends in fur value relative to regional harvest trends.
3. 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.
4. The Game Take Survey should continue to query general license buyers regarding bobcat, fisher, and coyote observations. Effects of geographic sampling bias should be assessed now that the Pennsylvania Automated License System is fully implemented.
5. The PGC should continue educational efforts concerning techniques for avoiding otter captures.

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

7. Muskrat age ratio and reproductive information should be collected every 5 years (2017) to monitor fecundity and recruitment unless noticeable changes in population numbers occur.

LITERATURE CITED

Boyd, R. C., and M. Weaver. 2010. Game Take and Furtaker Surveys. Annual Job Report 11101. Pennsylvania Game Commission. Harrisburg, USA.

Johnson, J. B., R. C. Boyd, and M. Weaver. 2012. Game Take and Furtaker Surveys. Annual Job Report 11101. Pennsylvania Game Commission. Harrisburg, USA.

Table 1. Number of furtaker licenses sold in Pennsylvania.

Year	Furtaker licenses sold	Combination 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 ^a	
2000	18,551 ^a	
2001	19,410 ^a	
2002	20,676 ^a	
2003	22,454 ^a	
2004	24,094 ^a	
2005	23,941 ^a	
2006	26,589 ^a	
2007	28,032 ^a	
2008	29,707 ^a	
2009	31,110 ^a	
2010	35,267 ^a	
2011	36,192 ^a	
2012	39,913	104,883
2013	44,589	112,838

^a Combination license holders were extended furtaker privileges since 1999, but the number who pursue furbearers was not determined until the 2012 season. Therefore, prior to 2012, the number of licenses sold misrepresented to an unknown degree the number of furtakers in Pennsylvania.

Table 2. Annual harvest and percent change (% Δ) of 3-year moving average by species in Pennsylvania during 1990-2013.

Year ^a	Raccoon	% Δ	Red Fox	% Δ	Gray Fox	% Δ	Coyote ^b	% Δ	Muskrat	% Δ	Mink	% Δ	Beaver ^c	% Δ	Skunk	% Δ	Opossum	% Δ	Weasel	% Δ
1990-91	116,443		32,699		21,683		1,810		112,358		7,053		3,431		9,298		36,574		798	
1991-92	130,608		28,495		30,409		3,719		156,014		10,355		4,107		8,907		37,177		481	
1992-93	124,404	0.7	27,611	-7.7	25,395	2.8	4,402	43.8	135,533	2.3	9,157	2.8	4,506	1.5	7,221	-5.4	27,754	-10.6	343	-16.8
1993-94	118,964	15.0	25,862	2.6	23,839	3.7	6,161	17.7	121,657	5.4	7,808	-0.5	3,606	43.0	7,920	15.4	25,807	-8.3	526	17.9
1994-95	186,551	-0.9	30,649	4.2	33,387	-2.3	6,240	13.4	178,145	-1.2	10,208	-2.0	9,360	11.1	12,620	10.0	29,621	2.3	723	21.6
1995-96	120,462	22.5	31,110	4.3	23,518	-0.7	6,662	9.4	130,442	5.7	8,602	5.7	6,454	31.8	9,995	12.0	29,688	26.7	687	3.3
1996-97	214,958	1.6	29,623	6.9	23,307	-9.2	7,959	2.1	146,013	8.3	9,315	13.7	9,789	12.8	11,571	-0.8	48,549	28.8	589	22.5
1997-98	194,696	14.1	36,923	16.5	26,043	12.9	6,685	23.4	216,066	3.6	14,063	11.4	12,628	7.9	12,344	3.5	60,717	19.1	1,172	-1.0
1998-99	195,110	-17.8	47,202	6.4	32,922	4.2	11,652	5.9	148,205	-10.2	12,238	12.5	8,727	-4.5	11,190	-13.8	56,287	-9.0	662	-6.6
1999-00	107,407	-17.3	36,860	-3.2	26,794	-1.9	9,508	13.3	94,215	-29.7	13,774	-13.6	8,377	-14.2	6,723	-15.9	33,723	-21.0	429	-36.8
2000-01	108,890	-17.8	33,060	-12.1	24,452	-11.5	10,383	2.3	79,880	-8.1	8,614	2.8	8,408	8.7	7,534	-7.6	29,093	-24.4	340	-0.3
2001-02	121,810	-0.3	33,003	-3.7	23,275	-10.7	12,363	6.0	121,994	-6.4	13,214	-10.4	10,934	-13.8	9,245	2.1	27,192	1.2	657	-1.6
2002-03	106,485	-1.2	33,007	-1.5	18,805	-12.8	11,444	3.8	75,340	-3.1	10,069	-6.6	4,538	-2.2	7,207	7.4	34,787	5.1	406	1.4
2003-04	104,781	-4.7	31,592	7.7	15,956	-9.8	11,697	-7.6	71,368	-19.0	6,494	-13.0	7,874	14.3	9,319	2.9	33,760	17.3	359	-6.3
2005-06	106,082	10.1	40,551	11.9	17,616	3.7	9,670	1.3	70,995	21.1	9,335	10.1	14,283	36.2	9,997	13.1	43,770	11.9	567	6.1
2006-07	138,640	4.8	45,512	17.3	20,754	4.9	11,879	5.0	121,167	19.0	12,680	12.3	14,210	10.1	10,687	1.7	48,102	5.9	487	5.7
2007-08	121,466	10.0	52,000	3.0	18,613	5.7	13,360	8.9	121,446	1.0	10,004	-2.2	11,542	-10.8	9,818	7.7	41,168	7.9	440	-4.2
2008-09	142,808	-6.5	44,745	-5.7	20,845	-11.6	12,776	4.1	74,059	-18.1	8,632	-17.3	9,942	-12.6	12,331	-7.2	54,273	-7.5	504	-1.3
2009-10	112,550	1.1	37,418	2.0	13,793	-5.5	13,438	3.5	63,988	-24.3	7,261	-7.0	9,704	-7.3	8,314	-2.9	37,270	-3.8	468	-0.3
2010-11	125,423	8.4	54,661	17.2	15,691	-2.9	14,732	7.7	58,296	7.7	8,204	13.4	9,254	28.6	8,935	2.5	36,188	-3.6	436	10.5
2011-12	174,858	23.6	68,214	18.7	19,380	7.4	15,924	13.7	89,274	13.8	11,855	19.0	18,212	0.0	13,057	-3.3	49,626	33.1	652	8.7
2012-13	210,146	14.1	67,465	3.5	17,415	0.0	19,470	3.0	93,153	10.6	12,454	-1.1	9,712	15.8	7,329	-4.1	78,024	12.8	604	-19.3
2013-14	197,380		61,392		15,700		16,256		83,880		7,856		15,134		7,733		57,138		110	

^a Furtaker survey was not conducted during the 2004-2005 season.

^b Coyote harvest is calculated from only the Furtaker Survey and does not include coyote harvests from the Game Take Survey.

^c Beaver harvest was based on mandatory pelt tagging totals until 2004. Harvest was estimated from furtaker surveys beginning with the 2005-06 season.

Table 3. Estimated harvests of furbearers by WMU during the 2013-2014 hunting and trapping seasons.

WMU	Raccoon	Red Fox	Gray Fox	Coyote ^a	Muskrat	Mink	Beaver	Skunk	Opossum	Weasels
1A	16,870	1,156	115	1,247	8,650	333	1,142	261	4,521	0
1B	17,570	1,175	99	794	8,222	733	2,752	277	3,592	8
2A	12,131	639	124	1,392	3,570	133	260	77	1,431	0
2B	9,000	530	228	689	1,484	22	182	154	761	0
2C	18,049	2,127	838	798	6,671	589	208	507	4,003	16
2D	16,617	1,060	2,140	475	5,629	311	883	369	3,866	8
2E	3,869	392	1,077	200	1,457	78	571	61	1,857	0
2F	4,252	499	326	277	1,016	89	1,220	169	1,796	8
2G	3,874	905	1,084	760	762	100	260	338	1,933	8
2H	952	72	149	199	67	167	208	31	624	0
3A	3,202	1,612	1,220	832	816	189	597	307	2,100	0
3B	4,195	1,038	975	1,552	1,096	56	337	215	2,177	0
3C	5,370	914	1,033	1,679	2,968	289	2,077	0	1,887	24
3D	1,529	1,122	192	781	361	89	753	77	472	8
4A	5,244	1,832	1,565	507	2,473	167	104	92	670	0
4B	8,045	2,639	402	419	5,709	722	78	538	2,359	0
4C	5,777	3,735	730	832	1,070	211	104	477	1,994	8
4D	12,545	1,975	1,453	662	7,514	522	675	630	4,262	8
4E	8,868	3,218	561	777	6,538	622	493	646	4,049	0
5A	7,726	7,763	549	180	6,498	711	130	569	2,572	0
5B	11,823	10,875	210	504	5,415	389	78	1,399	4,384	0
5C	9,396	10,820	124	244	2,126	822	467	246	2,024	0
5D	241	424	0	0	160	0	26	0	609	0
Unknown	10,235	4,870	506	456	3,608	512	1,529	293	3,195	14
Total	197,380	61,392	15,700	16,256	83,880	7,856	15,134	7,733	57,138	110

^a Coyote harvest is calculated from only the Furtaker Survey and does not include coyote harvests from the Game Take Survey.

Table 4. Average pelt prices paid for furbearer species in Pennsylvania.

Trapping season	Average pelt price (\$) ^a										
	Raccoon	Red Fox	Gray Fox	Coyote	Muskrat	Mink	Beaver	Skunk	Opossum	Bobcat	Fisher
1986-87	19.89	29.15	33.76	31.57	4.84	24.19	33.00	1.00	3.05		
1987-88	9.78	17.20	31.93	13.50	5.36	31.11	22.60		1.99		
1988-89	5.29	15.97	11.58	19.00	2.91	29.45	20.22		1.28		
1989-90	3.40	9.30	8.79	11.60	1.42	22.29	17.77	1.92	1.11		
1990-91	3.35	8.83	8.43	10.01	1.61	19.06	9.71	1.00	0.96		
1991-92	7.12	13.55	12.78	18.37	2.95	26.23	13.14	2.25	2.17		
1992-93	6.77	12.96	11.32	25.40	2.25	19.95	10.63		1.71		
1993-94	8.54	15.44	11.02	24.15	2.88	18.35	19.03	2.66	1.88		
1994-95	9.15	18.73	11.47	24.70	3.09	14.08	19.94	2.21	1.51		
1995-96	10.27	16.30	9.40	13.36	3.15	11.88	19.65	3.00	1.74		
1996-97	15.34	18.05	11.94	20.68	6.03	19.06	29.37	3.92	1.83		
1997-98	12.07	13.18	9.65	9.72	3.44	11.66	21.73		1.41		
1998-99	6.87	9.73	4.84	6.40	1.87	9.48	15.29		0.49		
1999-00	4.94	10.72	6.19	15.43	3.16	9.75	16.08		1.47		
2000-01	7.42	16.58	8.61	16.07	3.40	9.64	20.00		2.47		
2001-02	8.34	20.14	10.05	17.16	3.85	8.47	15.86		1.54		
2002-03	9.39	22.84	12.81	22.57	3.81	9.69	14.33		2.12		
2003-04	10.15	19.92	18.74	25.29	3.33	10.50	15.84		2.03		
2005-06	10.11	16.48	18.04	9.37	2.89	12.84	16.11	3.14	2.51		
2006-07	17.50	20.36	26.54	24.50	6.10	17.42	17.18	4.50	5.05		
2007-08	12.88	20.84	43.84	20.02	3.20	12.88	22.14	4.04	2.45		
2008-09	9.79	11.58	25.11	12.37	3.96	10.06	18.05	4.42	3.45	26.36	
2009-10	11.58	10.48	20.76	17.27	7.35	11.02	18.29	4.62	2.62	43.50	
2010-11	12.38	14.63	19.59	18.40	6.92	13.95	14.90	3.62	1.99	36.83	41.60
2011-12	12.81	23.48	23.87	15.52	11.00	19.48	21.36	3.30	2.26	46.52	36.42
2012-13	15.14	41.34	29.65	20.62	13.38	24.86	22.32	3.05	3.23	76.12	84.00
2013-14	14.67	38.07	25.98	23.15	12.56	18.89	21.26	3.36	4.09	81.72	74.00

^aAverage pelt prices paid at PA Trappers Association fur sales. Weasel pelt prices were excluded due to small sample sizes.

Table 5. Numbers of incidental bobcat captures as estimated from the annual Furtaker Survey. This survey was not conducted during 2004-2005.

Trapping season	No. survey respondents	No. furtaker licenses	No. bobcats^a captured and released	Extrapolated no. bobcat captures	3-year moving average^b (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	1,076	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	1,133	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	951
2005-2006	2,412	23,941	165	1,638	1,414
2006-2007	2,436	26,589	175	1,910	1,916
2007-2008	2,994	28,032	235	2,200	2,405
2008-2009	2,622	29,717	274	3,105	2,533
2009-2010	3,186	31,110	235	2,295	2,388
2010-2011	4,421	35,267	221	1,763	2,106
2011-2012	4,080	36,192	212	2,259	1,983
2012-2013	3,223	39,913	105	1,928	2,068
2013-2014	4,439	44,589	175	2,016	

^a Does not include bobcats legally harvested by permit holders.

^b $r = 0.90$, $P < 0.05$

Table 6. Reports of bobcat and fisher sightings by county from the annual Game Take Survey, 2001-2009. Furtaker Survey was not conducted in 2004. Estimate was not conducted since 2008.

Year	Season	N (%)	Effort days	Bobcat		Fisher	
				Number	SI ^a	Number	SI ^a
2001	Spring Turkey Hunters	2,785 (24.8)	12,735	200	1.57	90	0.71
	Firearms Deer Hunters	8,628 (76.9)	40,254	585	1.45	152	0.38
	Archery Deer Hunters	3,237 (28.8)	36,439	407	1.12	134	0.37
	All Hunters	11,221 (100.0)	89,428	1,192	1.33	376	0.42
2002	Spring Turkey Hunters	2,423 (24.8)	10,952	205	1.87	43	0.39
	Firearms Deer Hunters	7,176 (73.3)	33,412	465	1.39	170	0.51
	Archery Deer Hunters	2,816 (28.8)	31,396	266	0.85	95	0.3
	All Hunters	9,777 (100.0)	75,760	936	1.24	308	0.41
2003 ^b	Spring Turkey Hunters	2,728 (27.3)	12,147	131	1.08	49	0.4
	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
2005	Spring Turkey Hunters	2,845 (21.7)	12,327	163	1.32	104	0.84
	Firearms Deer Hunters	7,213 (55.0)	35,011	316	0.9	107	0.31
	Archery Deer Hunters	3,065 (23.4)	28,674	442	1.54	125	0.44
	All Hunters	13,123 (100.0)	76,012	921	1.21	336	0.44
2006	Spring Turkey Hunters	2,580 (20.7)	10,243	481	4.7	121	1.18
	Firearms Deer Hunters	6,865 (55.0)	32,609	707	2.17	230	0.71
	Archery Deer Hunters	3,025 (24.3)	32,065	109	0.34	109	0.34
	All Hunters	12,470 (100.0)	74,917	1,297	1.73	460	0.61
2007	Spring Turkey Hunters	2,369 (25.2)	9,467	316	3.33	70	0.73
	Firearms Deer Hunters	5,736 (60.9)	57,500	784	1.36	270	0.46
	Archery Deer Hunters	2,832 (30.0)	13,445	385	2.86	171	1.27
	All Hunters	9,415 (100.0)	80,412	1,485	1.84	511	0.63
2008	Spring Turkey Hunters	4,498 (20.2)	9,676	270	2.79	111	1.15
	Firearms Deer Hunters	12,350 (55.5)	29,739	502	1.69	224	0.75
	Archery Deer Hunters	5,412 (24.3)	29,478	348	1.18	116	0.39
	All Hunters	8,478 (100.0)	68,893	1,120	1.63	451	0.65

^a SI = Sighting Index = observations/effort * 100

Table 7. Numbers of incidental fisher captures estimated from the annual Furtaker Survey. This survey was not conducted during 2004-2005.

Trapping season	No. survey respondents	No. furtaker licenses	No. fisher captured and released	Extrapolated no. fisher captures	3-year moving average (no. fisher captures)^a
1999-2000	1,557	17,414	5	56	
2000-2001	1,681	18,551	1	11	47
2001-2002	1,553	19,410	6	75	71
2002-2003	1,779	20,676	11	128	102
2003-2004	2,204	22,454	10	102	351
2005-2006	2,412	23,941	83	824	625
2006-2007	2,436	26,589	87	950	919
2007-2008	2,994	28,033	105	983	1,275
2008-2009	2,622	29,717	167	1,893	1,349
2009-2010	3,186	31,110	120	1,171	1,332
2010-2011	4,421	35,267	117	933	1,245
2011-2012	4,080	36,192	163	1,632	1,403
2012-2013	3,223	39,913	118	1,644	1,511
2013-2014	4,439	44,589	104	1,257	

^a $r = 0.96$, $P < 0.001$

Table 8. Reports of otter and fisher captures and fisher observations estimated from annual WCO questionnaires.

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
2005	123	50	49	341
2006	118	44	86	385
2007	133	57	132	481
2008	132	47	138	561
2009	125	36	106	615
2010	125	51	101	653
2011	131	59	130	837
2012	131	53	113	808
2013	132	45	94	999

Table 9. Types and numbers of coyote-related complaints reported to WCOs.

	Survey Period													
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Proportion of WCO districts reporting coyote complaints (%)	48	45	--	44	53	66	64	44	54	62	50	59	61	58
Complaint nature/ species affected														
Cattle	11	11	11	11	16	18	24	9	12	12	11	13	13	17
Sheep	26	17	15	30	23	43	29	19	22	29	20	19	26	23
Goats	1	1	1	4	3	5	3	4	7	4	5	4	8	5
Poultry	14	15	15	15	25	24	11	19	16	14	21	24	25	20
Dogs	22	12	12	10	19	12	19	8	9	17	8	12	9	5
Cats	29	23	22	24	77	25	38	28	19	25	29	27	24	17
Afraid of Coyotes	126	114	115	98	316	263	199	155	171	219	193	258	229	221
Deer	57	29	28	50	87	73	36	61	74	39	53	53	65	37
Turkeys	18	6	5	13	37	31	12	12	21	17	14	23	18	15
Other	0	7	8	26	0	32	36	36	32	17	31	48	18	33
Total Complaints	304	235	232	281	603	526	407	351	383	393	385	481	435	393
Coyote-caused mortalities														
Cows	1	0	0	0	0	2	0	1	1	0	1	0	0	2
Calves	8	5	5	4	13	10	27	7	9	8	7	7	10	12
Sheep	91	21	21	31	37	30	47	28	47	57	25	22	49	41
Goats	0	1	1	6	0	0	2	3	4	3	4	5	6	5
Poultry	44	49	48	66	85	51	71	93	132	76	97	68	106	77
Dogs	17	5	6	3	4	3	3	1	2	1	1	7	3	0
Cats	30	21	21	14	73	16	33	15	34	19	18	53	28	25
Rabbits	3	2	2	8	5	8	12	2	8	16	6	7	5	7
Deer	9	10	10	12	17	13	10	8	10	7	6	8	6	11
Other	3	0	0	0	2	2	1	1	0	1	0	1	0	1
Total Depredation	206	114	114	140	236	135	206	159	247	188	165	178	213	181

Table 10. Frequency of furbearer complaints received by Wildlife Conservation Officers (coyotes and beavers excluded).

Species	2009	2010	2011	2012	2013
Bobcat	50	37	52	75	63
Fisher	23	14	32	52	44
Fox	235	219	261	301	257
Weasel	17	12	22	20	26
River Otter	7	10	19	10	18
Mink	27	10	24	13	21
Muskrat	73	126	68	73	61
Raccoon	763	960	820	942	837
Opossum	139	121	97	117	90
Skunk	488	510	426	471	326

2013-2014 Furbearer Questionnaire

All questions pertain to furbearer information within your district during May 2012 to April 2013. If you are new to this district or cannot answer these questions, please submit this form anyway (leaving unknown answers blank) or forward it to the WCO who previously occupied or covered your district. **Please do not answer “many” or “a lot” to questions asking “How many?” Give us your best estimates.** Please note that these types of questions will be asked annually.

Instructions: Click on the **blue underline** or table box to enter text. Click on the **check box** (☐) to select or deselect that response. Press **Tab** to advance or click on the next entry field.

District No. _____ WCO Name _____

WMU	Number of beaver complaints

Beavers

1. How many beaver complaints were serviced within each WMU in your district? →

2. How many problem beavers did you trap and transfer to a new location? _____

3. How many problem beavers did you dispatch/euthanize? _____

4. How would you describe beaver populations in your district?

Beaver populations are present each year and are ... ☐ increasing, ☐ decreasing, ☐ stable

----- or -----

Beaver populations are not present each year and are ... ☐ poorly established, ☐ nonexistent

River Otters

5. How many river otters were accidentally caught by trappers within your district? _____

6. How would you describe river otter populations in your district?

Otter populations are present each year and are ... ☐ increasing, ☐ decreasing, ☐ stable

----- or -----

Otter populations are not present each year and are ... ☐ poorly established, ☐ nonexistent

Fishers

7. How many reliable reports of fishers have you received in your district? _____

8. How many fishers were accidentally caught by trappers in your district? _____

9. How would you describe fisher populations in your district?

Fisher populations are present each year and are ... ☐ increasing, ☐ decreasing, ☐ stable

----- or -----

Fisher populations are not present each year and are ... ☐ poorly established, ☐ nonexistent

Bobcats

10. How would you describe bobcat populations in your district?

Bobcat populations are present each year and are ... ☐ increasing, ☐ decreasing, ☐ stable

----- or -----

Bobcat populations are not present each year and are ... ☐ poorly established, ☐ nonexistent

Figure 1. Wildlife Conservation Officer furbearer questionnaire used during 2013-2014 (page 1).

Coyotes

11. Did you receive any coyote-related complaints during this period? ☐ *Yes* ☐ *No*

If you received coyote complaints, please record the type and number of complaints and animals killed. Omit any complaints that the Bureau of Dog Law Enforcement (PA Dept of Agriculture) serviced.

Number of Coyote Complaints:

Cattle
 Sheep
 Goats
 Poultry/Waterfowl
 Attacked Dogs
 Attacked Cats
 Afraid of Coyotes
 Chased/Attacked Deer
 Chased/Attacked Wild Turkey
 Other

Number of Animals Killed by Coyotes:

Cows
 Calves
 Sheep/Lambs
 Goats
 Poultry/Waterfowl
 Dogs
 Cats
 Rabbits
 Deer
 Other

Nuisance Complaints

12. If you received nuisance complaints concerning other furbearer species, how many occurred in your district?

Number of Complaints: Bobcat River Otter Raccoon
 Fisher Mink Opossum
 Fox Muskrat Skunk
 Weasel Other furbearer

Other Mammals - Porcupines

13. How many porcupine complaints did you receive in your district during the past year?

14. Excluding the winter months, approximately how many dead porcupines did you see on average along roadways within your district?

(unique/individual porcupines, not counted more than once)

- a ☐ *none*
b ☐ *less than one each month*
c ☐ *1-3 each month*
d ☐ *1-6 each week*
e ☐ *one or more each day*

15. How would you describe porcupine populations in your district?

Porcupine populations are present each year and are ... ☐ *increasing*, ☐ *decreasing*, ☐ *stable*

----- **or** -----

Porcupine populations are not present each year and are ... ☐ *poorly established*, ☐ *nonexistent*

Thank you for your cooperation and assistance!

Please return this questionnaire to your regional wildlife management supervisor and other appropriate supervisors as an e-mail attachment.

Figure 1 (cont.). Wildlife Conservation Officer furbearer questionnaire used during 2013-2014 (page 2).

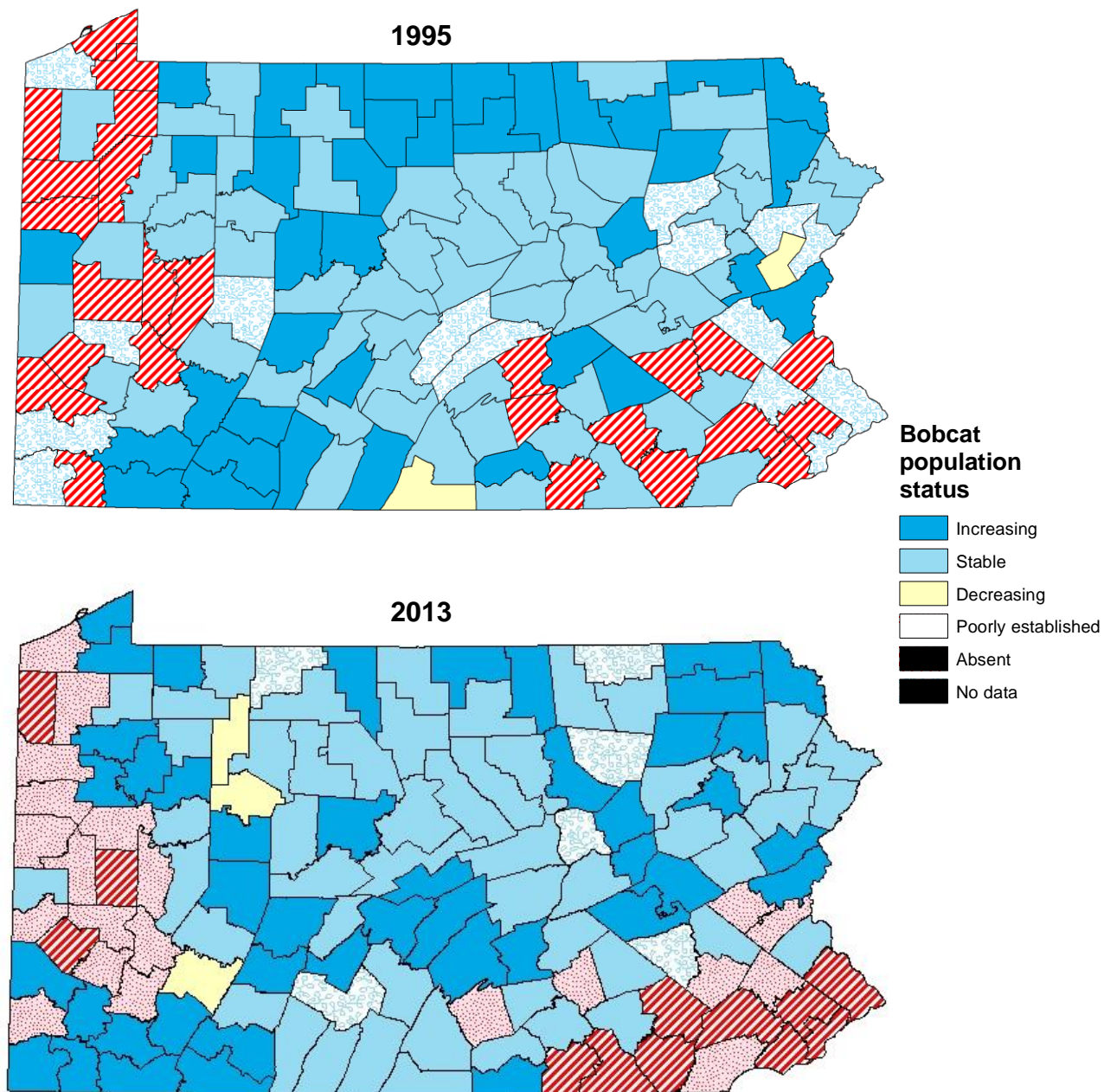


Figure 2. Bobcat population status and distribution based on Wildlife Conservation Officer observations during 1995 and 2013.

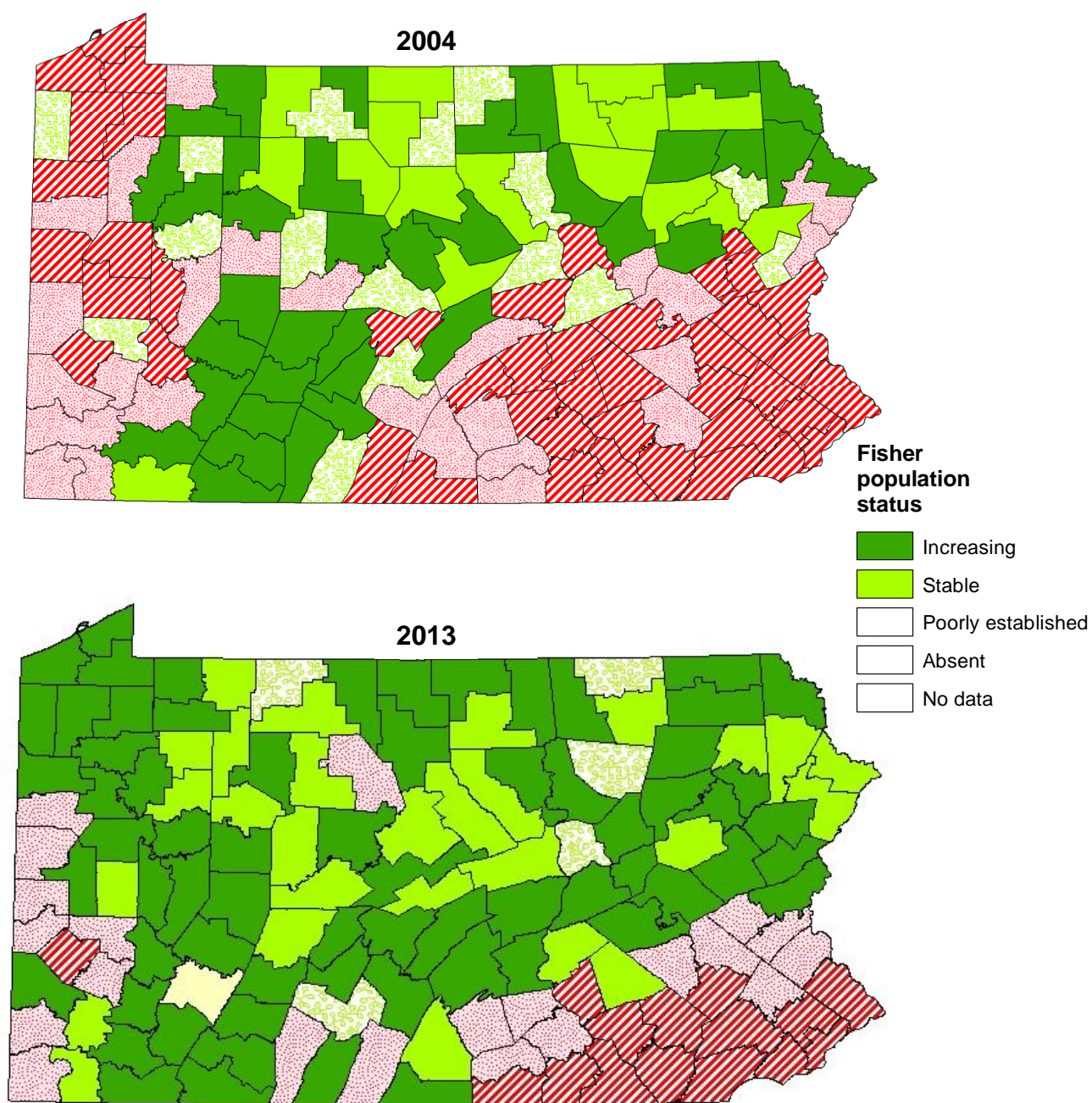


Figure 3. Fisher population status based on Wildlife Conservation Officer observations during 2004 and 2013.

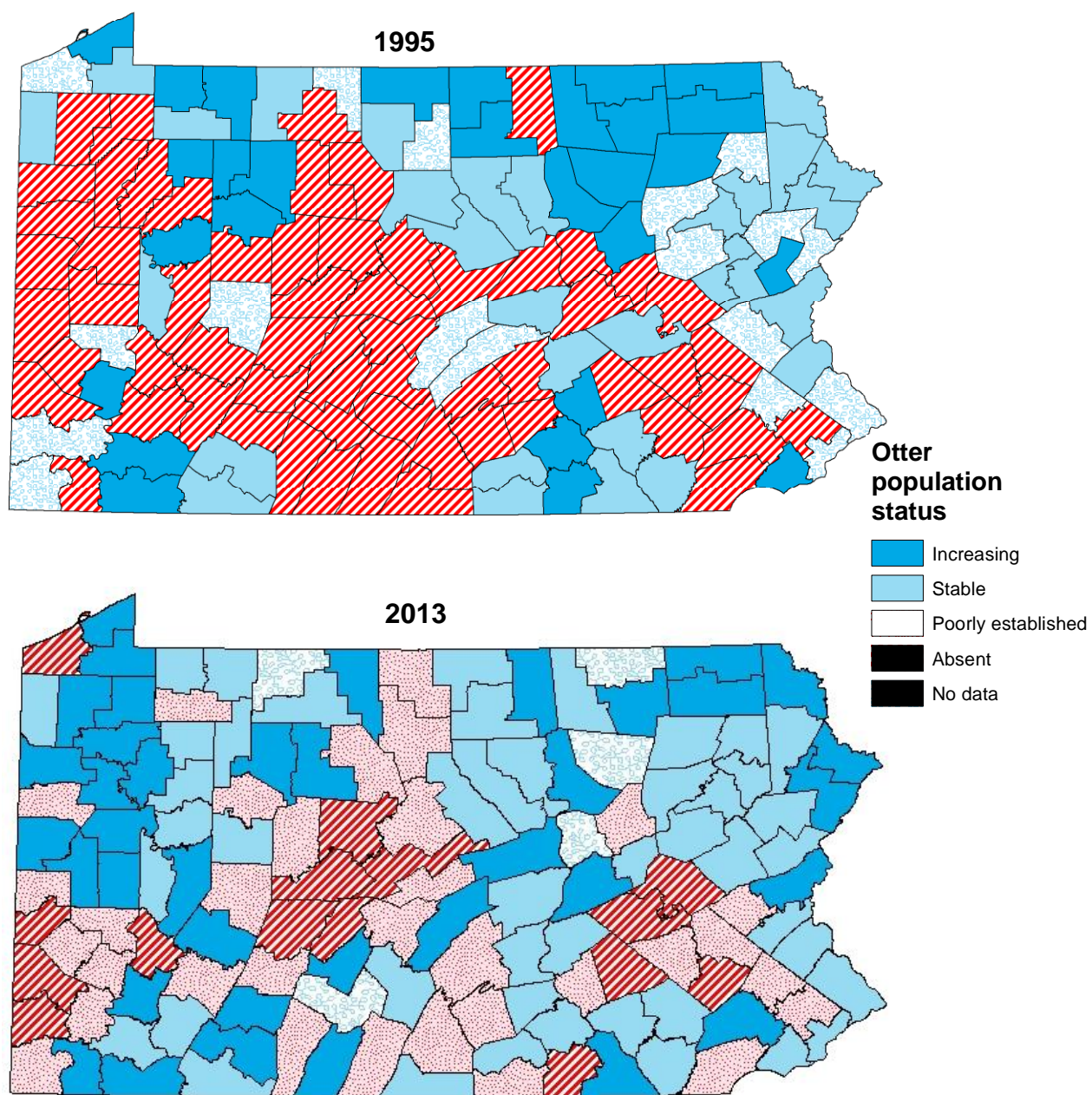


Figure 4. River otter population status based on Wildlife Conservation Officer observations during 1995 and 2013.

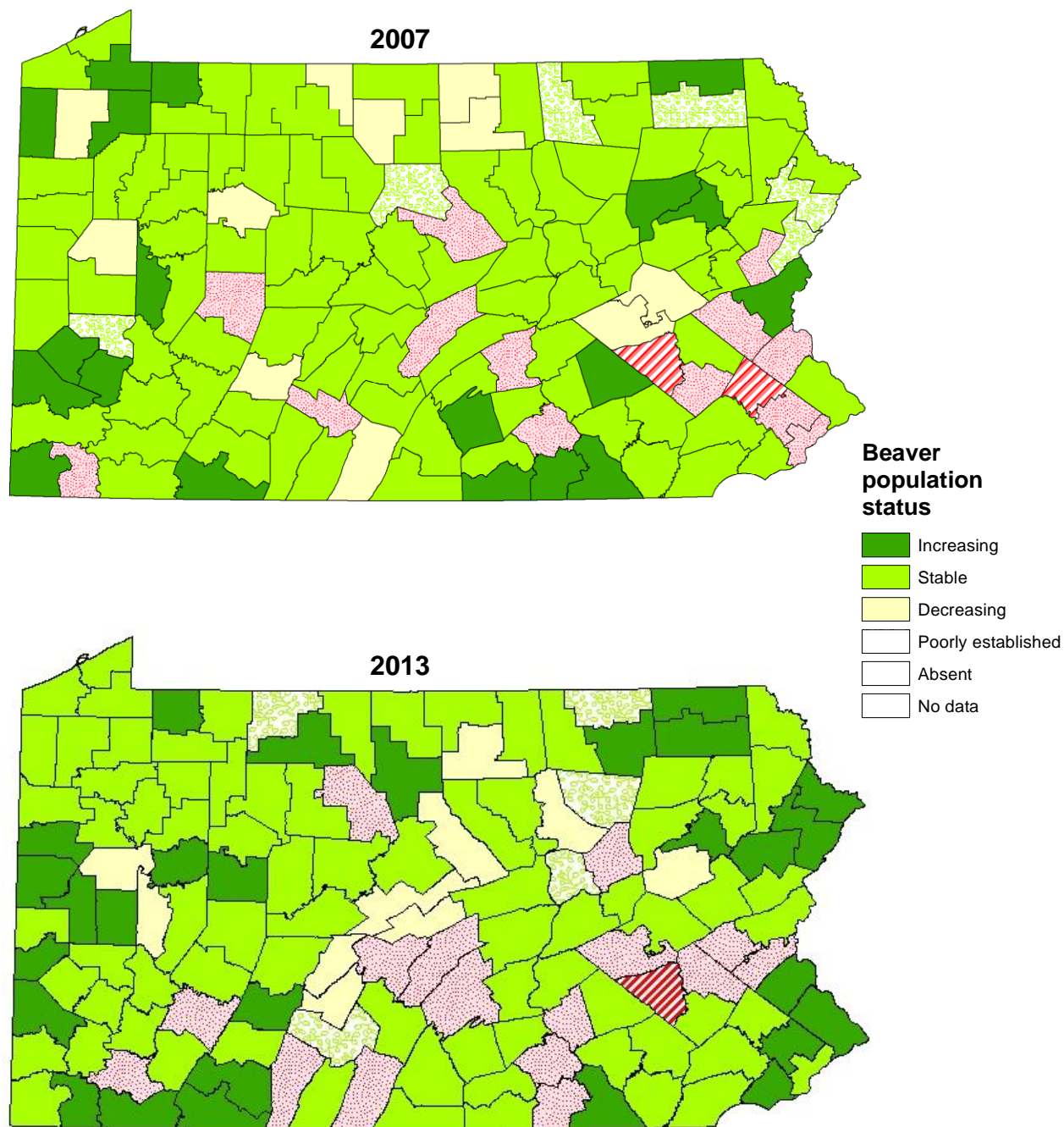


Figure 5. Beaver population status based on Wildlife Conservation Officer observations during 2007 and 2013.

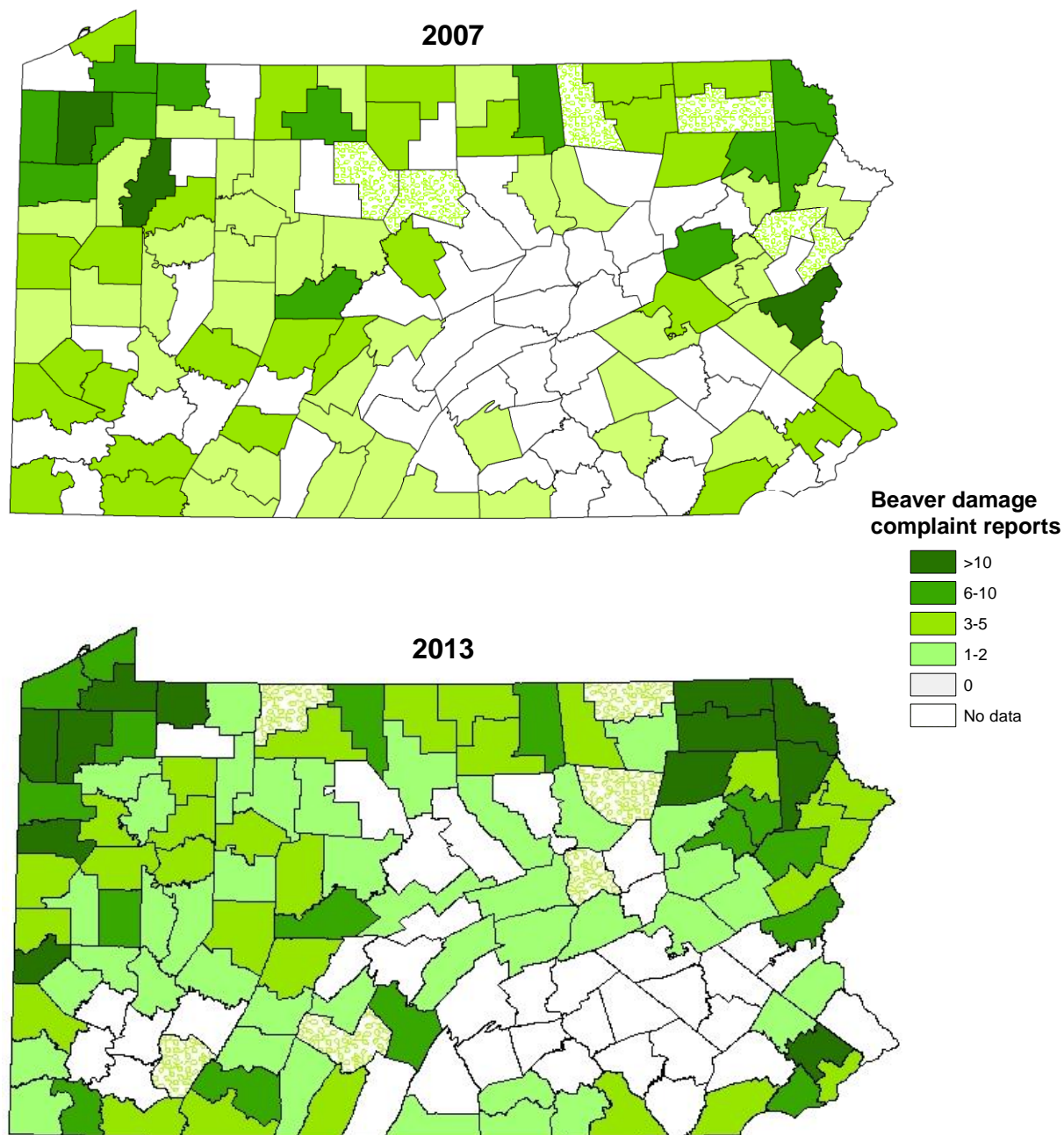


Figure 6. Distribution and frequency of beaver complaints reported to Wildlife Conservation Officers during 2007 and 2013.

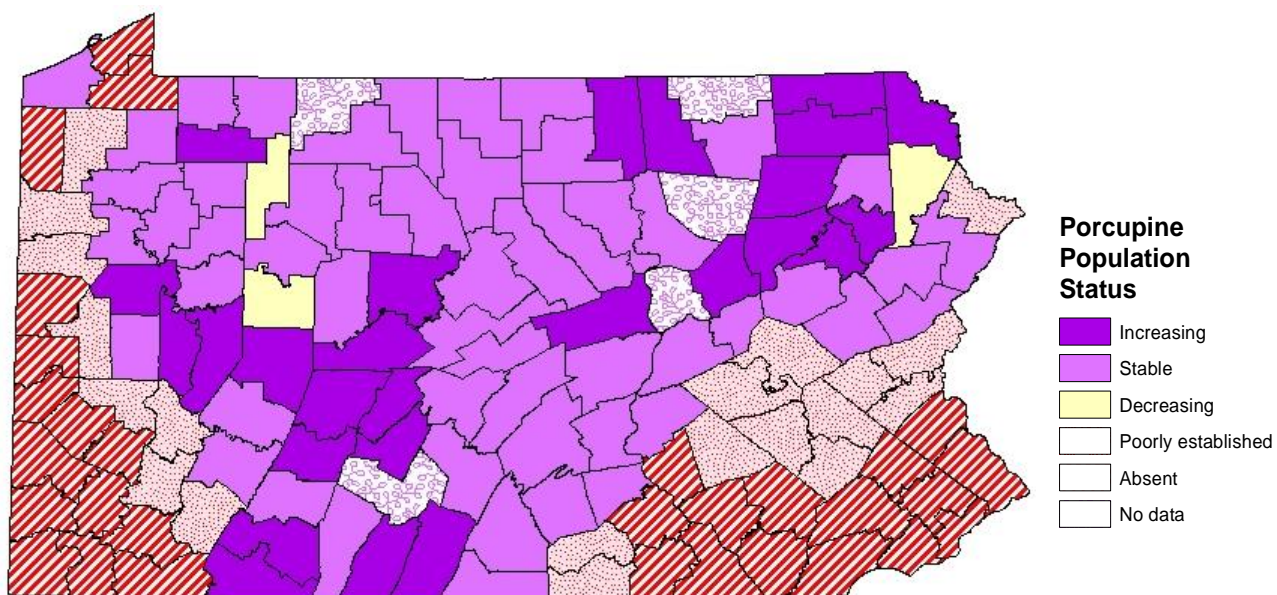


Figure 7. Porcupine population status based on Wildlife Conservation Officer observations during 2013.

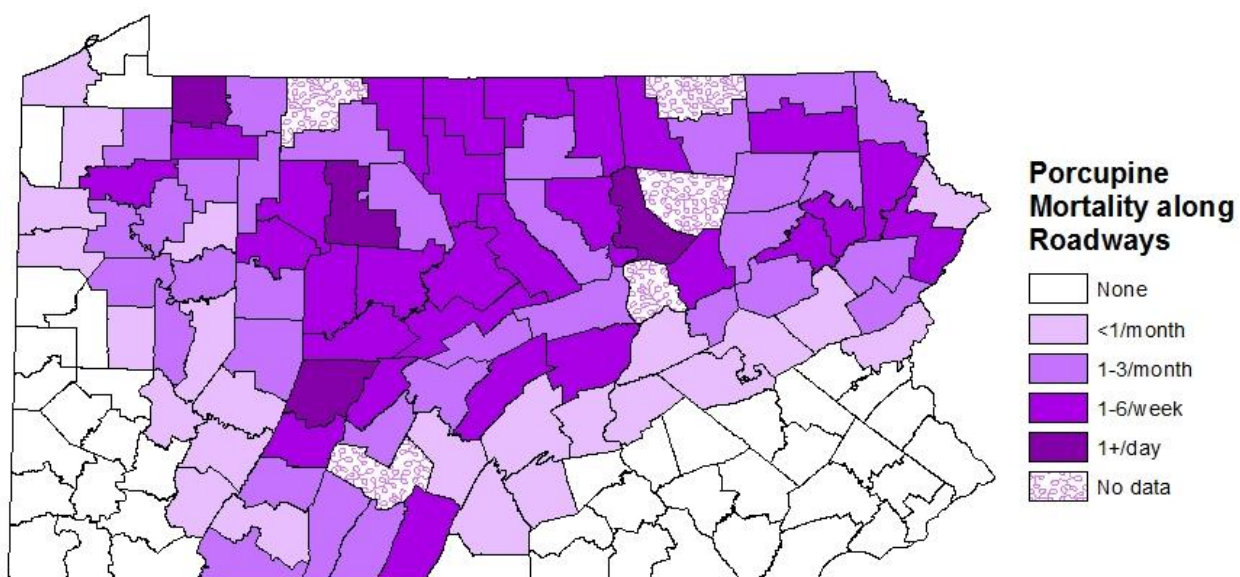


Figure 8. Wildlife Conservation Officer rates of porcupine mortality observation along roadways during 2013.