

**PENNSYLVANIA GAME COMMISSION
BUREAU OF WILDLIFE MANAGEMENT
PROJECT ANNUAL JOB REPORT**

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TITLE: River Otter Research/Management

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TITLE: River Otter Management Plan

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COOPERATING AGENCIES: None

WORK LOCATION: Statewide

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ABSTRACT A river otter management plan was needed to establish stable river otter populations in balance with their habitat through proper population monitoring and harvest management. Implementation of the plan included preparation of a harvest proposal for Board of Commissioner consideration. A plan was prepared and included history, status, and management information. A harvest season format was recommended. On 10 April 2015, a regulated river otter harvest season was unanimously approved by the Board of Commissioners.

OBJECTIVES

Establish stable river otter populations in balance with their habitat through proper population monitoring and harvest management.

METHODS

The purpose of the river otter management plan is to provide an overview of the current state of knowledge pertaining to river otter biology, habitat, history, resource value, and population management and provide direction for future management. It represents our guide to managing otter populations in Pennsylvania for the next 10 years. It also serves as an information and education resource for anyone seeking answers to questions concerning river otter life history and past, present, and future otter management in the Commonwealth.

Objectives defined in the plan identify the necessary steps to achieve each of the 4 goals. Strategies consisting of actions and research needs were developed to attain each objective.

Improved population and reproductive monitoring, harvest management, habitat assessment, population management, trapping regulations, damage management, outreach, and public engagement are among the most important needs identified.

In keeping with our agency mission, river otters must be managed for the benefit of other wildlife species, their habitats, and all Pennsylvanians for generations to come. Our otter management mission is to maintain stable otter populations in balance with their habitat for the benefit of other wildlife species and humans through proper monitoring, population management, and damage control. The goals of Pennsylvania's river otter management are to 1) maintain sustained otter populations within suitable habitat, 2) minimize otter damage complaints, 3) increase public awareness and knowledge of the benefits of otters and their habitat, and 4) develop guidelines to assess river otter harvest feasibility and implement a harvest management program.

Pennsylvania's otter management plan provides the necessary direction to achieve enhanced populations, habitat, and monitoring, increased public awareness and knowledge of otters, and sustained resource opportunities for both consumptive and non-consumptive users of this valuable furbearer. Only through careful planning and sound science will we maintain a healthy balance between otters and human interests, and manage sustained river otter populations for future generations.

As part of river otter management plan implementation, consideration of a highly-regulated harvest season was placed on the Board of Commissioners meeting agenda during their 25-27 January 2015 meeting. In preparation for the meeting, the Board requested we prepare a river otter harvest proposal for Pennsylvania.

RESULTS

A river otter harvest season proposal was prepared and orally presented to the Board of Commissioners on 26 January 2015. The otter harvest proposal included the history, status, and management information summarized below. A harvest season format was recommended. On 10 April 2015, a regulated river otter harvest season was unanimously approved by the Board of Commissioners. We applied for Convention on International Trade of Endangered Species (CITES) approval to grant issuance and use of CITES tags for river otters in Pennsylvania.

History

Once widely distributed and relatively abundant, otter populations entered a period of very low numbers beginning in the late 1800s. The combined effects of habitat destruction, water pollution, and unregulated harvest ultimately caused the extirpation of river otters from most of Pennsylvania and much of the entire country. Toxic stream conditions were produced by drainage from tanneries, mines, oil wells, chemical works, factories, and foundries.

Deteriorating water quality quickly eliminated fish and other aquatic life from Pennsylvania's waterways. The last recorded otter in the Allegheny River was in 1899; the last in Pymatuning Swamp was in 1908. In 1952, the Pennsylvania Game Commission closed otter trapping season. River otters were never completely extirpated from Pennsylvania, but their

numbers were vastly reduced. The Pocono region always supported otters, especially the counties of Wayne, Pike, and Monroe.

Prior to 1900, degradation of water quality and habitat, human encroachment, and unregulated harvest led to a 75 percent decline in North American otter populations. As a result of dedicated efforts of concerned biologists and state wildlife agencies, reintroduction efforts, legal protection, improved habitat quality and regulated harvest, otter populations rebounded during the mid- to late 1900s.

Population Recovery

Nationwide, 21 states implemented river otter restoration projects during 1976-1998, releasing 4,018 river otters. Based on various forms of direct and circumstantial evidence, most of these projects were considered successful in restoring extirpated otter populations.

During 1982-2004, the Pennsylvania River Otter Reintroduction Project, headed by Dr. Thomas Serfass, established stable, self-sustaining river otter populations in Pennsylvania. The program released 153 river otters successfully to 8 water systems in central and western Pennsylvania. A successful, ecologically-based, and publicly-supported reintroduction project resulted from the carefully planned effort.

States conducting reintroduction projects obtained otters from a variety of sources. Most (64%) states released at least some otters originating from coastal Louisiana as part of their reintroduction programs. Pennsylvania-released otters originated from Louisiana, Maryland, Michigan, New Hampshire, New Jersey, New York as well as relocated otters from the Pocono northeast.

Otter restoration efforts in Pennsylvania and similar efforts in neighboring states resulted in significant range expansion. Pennsylvania's otter population has been protected and growing for over 30 years since otter restoration was initiated. Restoration efforts, range expansion of native population, and influx from Ohio, New York, and Maryland restoration efforts led to successful population recovery.

Of the 49 states that otters inhabit, 37 manage a regulated otter harvest season (Fig. 1). Twelve states currently have closed otter seasons with 3 states listing otters as state threatened. Pennsylvania, Rhode Island, and Indiana are the only eastern states with a closed harvest season for river otters. Indiana is in the process of starting a regulated otter harvest. Where regulated harvest is permitted, regulations consist of restrictions on harvest season length, harvest methods, and bag limits. Harvest quotas are used in some states as well as mandatory reporting requirements.

The U.S. Fish and Wildlife Service (USFWS) recently announced a national no detriment finding for river otters which assures that the export of otters taken in states will not be detrimental to the survival of the species. This finding also applies to states opening otter harvest seasons for the first time.

Although river otters are not endangered, they are included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

because of the similarity of this species to other endangered otter species listed in the CITES Appendices. USFWS regulates and monitors the export of otter pelts from the United States. State wildlife agencies generally use a combination of monitoring methods to gain otter population status information.

Current Status in Pennsylvania

As part of our annual furbearer surveys, Wildlife Conservation Officers (WCOs) report the status of otter populations within their local districts (Fig. 2). In 1995, otters occupied 49% of WCO districts. In 2013, otters occupancy increased by 40%. Today, 89% of WCO districts support river otter populations. The most dense otter populations occur in the northwestern and northeastern counties.

All data suggest that otter populations are currently increasing in density and expanding geographically throughout Pennsylvania. Otter populations occupy all major river systems. The Delaware, Susquehanna, Allegheny, and Youghiogheny Rivers support sustained otter populations and act as travel corridors from which new populations disperse and expand geographically. The Potomac and Lake Erie watersheds maintain less dense populations, but continue to increase in otter numbers annually.

Population Monitoring

We currently use a combination of population indices such as accidental capture frequency and local status and distribution field surveys to monitor otter populations. Since no harvest season for otters exists in Pennsylvania, mortality information was collected from records of accidental captures, highway accidents, and mortalities resulting from damage control and illegal take (Fig. 3). Based on records of 211 otter carcasses collected since 1996, most reported mortality was a result of accidental captures (69%) and highway accidents (24%). A very small proportion (2%) of otter mortality was attributed to damage control measures and illegal take.

As river otter populations expanded throughout the Commonwealth, reports of accidental otter captures have steadily increased. Otters are typically captured in foothold or body-gripping traps set for raccoons or beavers. Some are released at the capture site by trappers or local wildlife conservation officers. Otter mortalities usually associated with body-gripping sets occur occasionally during beaver trapping and are not always avoidable.

Reports of accidental otter captures provide annual trends in relative density and distribution. Two independent survey mechanisms, the annual Furtaker Survey and the annual Wildlife Conservation Officer (WCO) furbearer questionnaire, are currently used to monitor accidental otter captures. These techniques are not designed to provide complete counts of these captures, but rather to monitor temporal trends in otter abundance and distribution.

The annual Furtaker Survey is a mail questionnaire sent to approximately 20% of licensed furtakers to assess harvest levels for various furbearers. Furtakers were asked to report the number and Wildlife Management Unit (WMU) locations of otters captured incidentally in traps set for other furbearers. There has been a general increase in the numbers of otters captured during the past 6 years (Table 1). If the number of otters captured per trapper was extrapolated to include all

furtakers, the estimated number of captured otters averages 150 each year during the 2007-2012 furtaker seasons.

WMU 3C, located in the northeast corner of Pennsylvania within sustained otter range, has the greatest number of incidental captures, averaging 37 each year (Fig. 4). Trappers in the northwestern WMUs, 1B and 2F, consistently catch an estimated average of 16 and 14 incidental otters each year, respectively. In central Pennsylvania, trappers sporadically catch incidental otters from WMUs 4D and 4E. The estimated mean incidental catch is 11 otters annually from these units. Lesser and more sporadic incidental otter captures occur in the remaining WMUs.

Furbearer questionnaires are mailed annually to all WCOs to collect a variety of furbearer information. Accidental captures of otters during the previous calendar year are reported by WCOs via this survey. This second measure of otter accidental captures shows an increasing linear trend during 1995-2013. There was little or no change in beaver trapping effort during the same period. Numbers of accidental otter captures, primarily by beaver trappers, have increased with greater than 25 captures reported annually since 1996.

Harvest feasibility

The Pocono northeast maintained stable or increasing river otter populations for the past 20 years and was also the area where river otter populations historically sustained themselves, despite extirpation throughout the remainder of Pennsylvania. Wildlife Management Units 3C and 3D includes the Pocono northeast area.

Area-specific harvest quotas are a sensitive management tool whose effectiveness cannot be matched by season-length adjustments or general bag limits. We propose a harvest quota system to regulate river otter take.

Starting in 2001, we attempted to minimize incidental captures of river otters by publishing capture avoidance guidelines in our Hunting and Trapping Digest. Body-gripping trap trigger configurations, snare loop sizes, and trap site locations to avoid otter captures were key topics covered in this attempt to improve beaver trapline techniques. This educational effort likely reduced incidental otter captures. We believe that the increasing trend in incidental otter captures depicted in Figure 5 relates more to otter range expansion and increasing population density than to any other factor. We expect the trend in incidental otter captures to stabilize or slightly increase as the use of otter capture avoidance techniques are used more widely.

Pennsylvania Cooperative Fish and Wildlife Research Unit researchers at Penn State University researchers are currently investigating a fecal DNA technique and developing a monitoring program to estimate otter population levels in Pennsylvania. They are currently using spatial capture/recapture models to estimate otter density in some areas of northeast Pennsylvania. Their results will provide an additional source of monitoring.

Otter harvests in the eastern United States

All northeastern states, with the exception of Rhode Island, annually maintain viable otter populations while allowing regulated harvest. We can model harvest strategies using information and experiences from regulated take programs administered in other eastern states.

Otter harvest rate, expressed as square miles per harvested otter ($\text{mi}^2/\text{harvested otter}$), is a reliable measure of harvest. All eastern states with an otter harvest season successfully sustain viable population levels with limited harvest on an annual basis. Harvest rates in those states are relatively consistent and provide a means for objective comparison.

Otter harvests in Connecticut, New Hampshire, Maryland, Maine, Virginia, Vermont, Delaware, Massachusetts, West Virginia, and New Jersey currently occur throughout all areas of each state. Only New York and Ohio maintain specific otter trapping zones. Harvest rates are lowest in states that do not permit the use of steel foothold or body-gripping traps for otters. Trap type can significantly affect harvest success.

Harvest rates ($\text{mi}^2/\text{harvested otter}$) in Table 2 depict harvest levels that have been safely administered by state wildlife agencies. Otter populations can safely withstand these levels of harvest. States adjoining Pennsylvania have otter harvest rates ranging from 18.59 (New York) to 161.24 (New Jersey) square miles/harvested otter. States with rates $>69 \text{ mi}^2/\text{harvested otter}$ have large areas of low or no harvest or trap restrictions that significantly impact trapper success. States with rates $<45 \text{ mi}^2/\text{harvested otter}$ have few restrictions that impact trapper success.

Liberal or unlimited otter season bag limits are characteristic of northeastern states with harvest rates >2 harvested otters/ 100 mi^2 . Season bag limits of 1 were associated with areas where harvest success was low or absent.

Today, Pennsylvania otter populations are increasing or are stable across their range. The Pocono northeast maintained stable or increasing river otter populations for the past 20 years and was also the area where river otter populations historically sustained themselves, despite extirpation throughout the remainder of the Commonwealth. Wildlife Management Units 3C and 3D includes the Pocono northeast area. A highly-regulated otter harvest is feasible in this portion of Pennsylvania.

A conservative harvest of 2 otters per 100 mi^2 would provide trapper opportunity, while safeguarding core populations in Pennsylvania WMUs 3C and 3D. In an area of $4,294 \text{ mi}^2$ (area of WMU 3C and 3D), a harvest of 85 otters would be targeted. In comparison to northeastern states with similar habitat conditions, Pennsylvania's proposed harvest rate of 1.99 otters/ 100 mi^2 is relatively low.

Area-specific harvest quotas are a sensitive management tool whose effectiveness cannot be matched by season-length adjustments or general bag limits. We propose a harvest quota system to regulate river otter take. A quota-based season with harvest quota of 85 otters is desired. Announcement of season closure would begin when 75% of the quota (60 otters) is reached. Trappers would be notified through email, text messaging, social media, webpage posting, news releases, and other forms of electronic communication. They would have a 24-hour grace period to shutdown their otter traplines and cease any effort to capture otters. Otter captures during the 24-hour grace period would be considered legal harvest.

The proposed season would occur during 21-23 February 2016 and could be extended at our discretion for up to 5 additional days if the harvest quota of 85 is not achieved. Late February is normally a period when the otter breeding season is just beginning. However, it is normal to have a wide variation in the timing of breeding, even within a local population.

Trap number and type restrictions would be in effect. Each trapper would be permitted to use up to 2 body-gripping traps. No more than 5 total trapping devices (foothold traps, body-gripping traps, and snares combined) would be permitted. We feel that limiting the total number of trapping devices permitted as well as limiting the number of body-gripping traps is necessary to reduce the chance of a trapper exceeding the one otter bag limit.

Mandatory harvest reporting and female carcass retention and surrender would be required. We gain important reproductive and population management information from female carcasses.

During concurrent beaver and river otter seasons, beaver trapping regulations would apply to all otter trapping activities with the exception of number and types of trapping devices permitted (reduced to 5 trapping devices, 2 of which may be body-gripping traps). A trap tag must be totally visible above the water or ice level on each trapping device. Trap placement near beaver dams and lodges would remain at 15 feet away from these structures. All general trapping regulations would apply to river otter trapping.

Special beaver regulations would apply in WMU 3C and 3D. During the period of calendar day overlap with river otter season, beaver trappers would be limited to using no more than 5 trapping devices, 2 of which may be body-gripping traps.

We propose the following river otter season format:

1. The river otter trapping season would occur during 21-23 February 2016. The season may be extended for up to 5 consecutive days if the anticipated quota of 85 is not reached.
2. River otter hunting would not be permitted.
3. WMUs 3C and 3D would be open for otter harvest (Fig. 1).
4. The season bag limit would be 1 otter per license year.
5. A river otter permit at a cost of \$6.70 would be established and a furtaker license would be required.
6. Reporting an otter harvest within 24 hours of capture would be mandatory.
7. Retention and surrender of entire female carcasses (excluding the pelt) would also be mandatory.
8. Beaver trapping regulations would apply to all otter trapping activities with the exception of number and types of trapping devices permitted.

9. Trap number and type restrictions would be in effect. No more than 2 body-gripping traps may be used. No more than 5 total trapping devices (foothold traps, body-gripping traps, and snares combined) would be permitted.

10. Special beaver regulations would apply in WMU 3C and 3D during the period of the calendar day overlap of beaver and river otter seasons. Beaver trappers would be limited to using no more than 5 trapping devices, 2 of which may be body-gripping traps during the season overlap.

RECOMMENDATIONS

1. Develop an otter management decision matrix based on population and habitat status information to help guide regulatory action.

2. Determine river otter population status and distribution using annual Wildlife Conservation Officer furbearer survey results.

3. Establish a direct-census method of determining population levels such as mark-recapture to achieve a high level of accuracy.

4. Annually survey agency staff to obtain the number of otter damage complaints received and information on type of damage.

Table 1. Incidental otter captures from surveys of furtakers.

Season	Survey respondents	Total number of furtakers	Otter captures	
			reported by survey respondents	Estimated total otter captures
2007-08	2,994	28,033	7	66
2008-09	2,622	29,717	12	136
2009-10	3,186	31,110	14	137
2010-11	4,421	35,267	24	191
2011-12	3,609	36,187	16	160
2012-13	3,223	39,913	17	211

Table 2. Otter harvest rates, bag limits, and season length in eastern states.

Eastern state (abbreviation)	Trapping land area (mi ²)	5-yr mean harvest	Harvested otters/ 100 mi ²	Season Bag Limit	Season length (days)	Notes
NY	23,607	1,270	5.38	Unlimited	172	
CT	4,845	193	3.98	8	131	
NH	8,968	262	2.92	10	178	
MD	9,774	283	2.90	1,2,10	91	
ME	30,862	759	2.46	Unlimited	59	
VA	39,594	927	2.34	4, Unlimited	89	
VT	9,250	209	2.26	Unlimited	125	
DE	1,954	44	2.25	Unlimited	104	Body-gripping traps prohibited.
PA	4,294		1.98	1 (Quota=85)	3-8	Proposed in WMUs 3C & 3D; Trap type & number restriction.
MA	7,840	113	1.44	Unlimited	44	Steel-jawed traps prohibited.
WV	24,078	197	0.82	1	119	No harvest success in 16 of 55 counties; Season started in 2011.
OH	18,427	145	0.79	1,3	64	Low harvest success in buffer zone; Season started in 2005.
NJ	7,417	46	0.62	1	45	Steel-jawed traps prohibited.

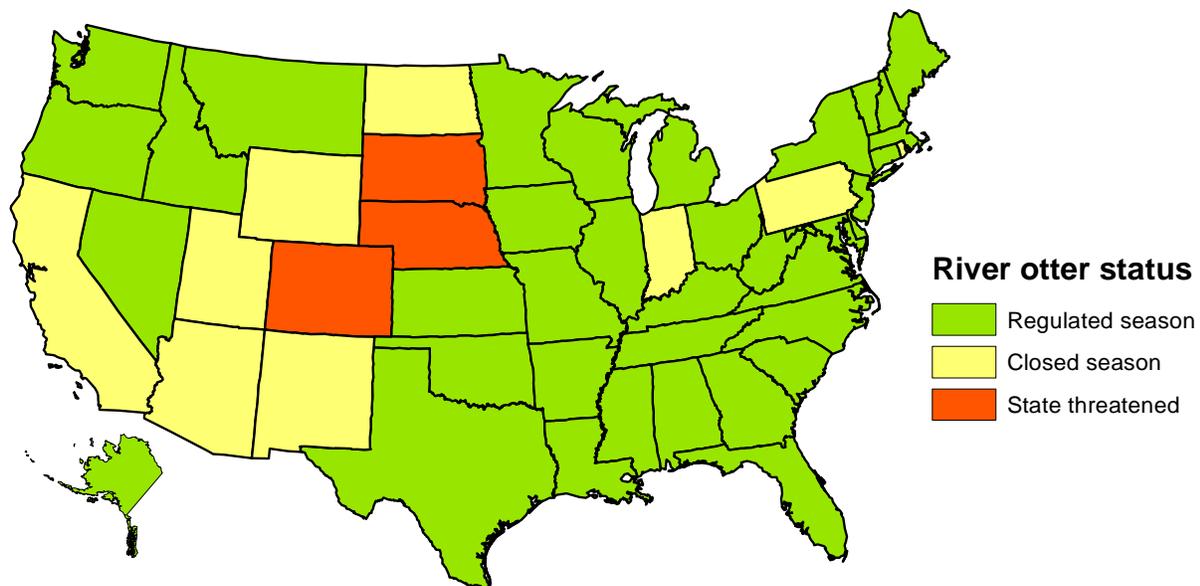


Figure 1. Status of river otters throughout the United States.

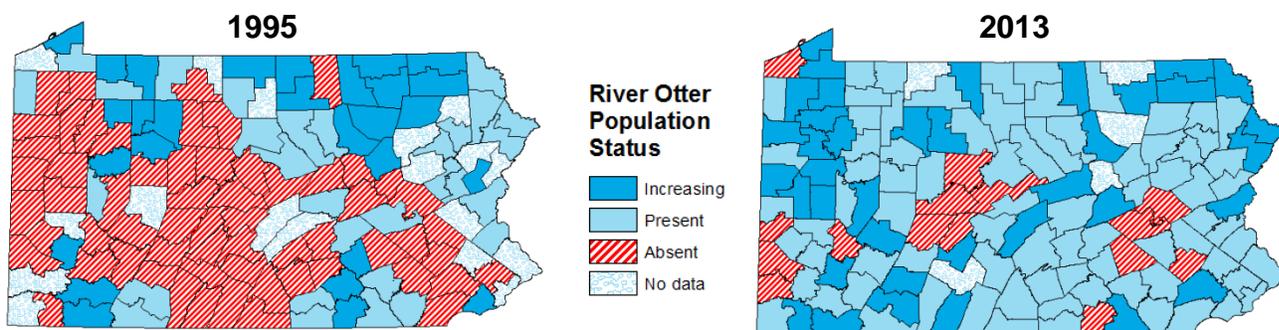


Figure 2. Status of river otters in Pennsylvania during 1995 and 2013.

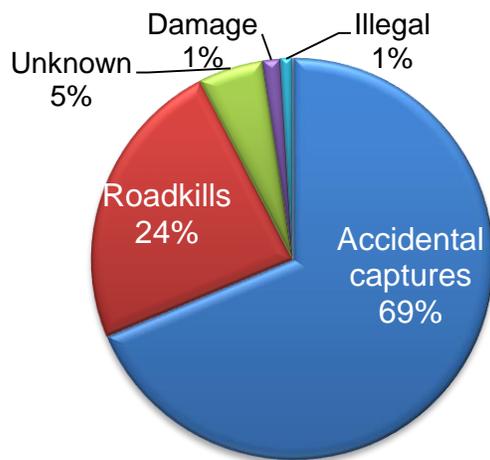


Figure 3. Reported mortality sources of river otters in Pennsylvania during 1996-2013.

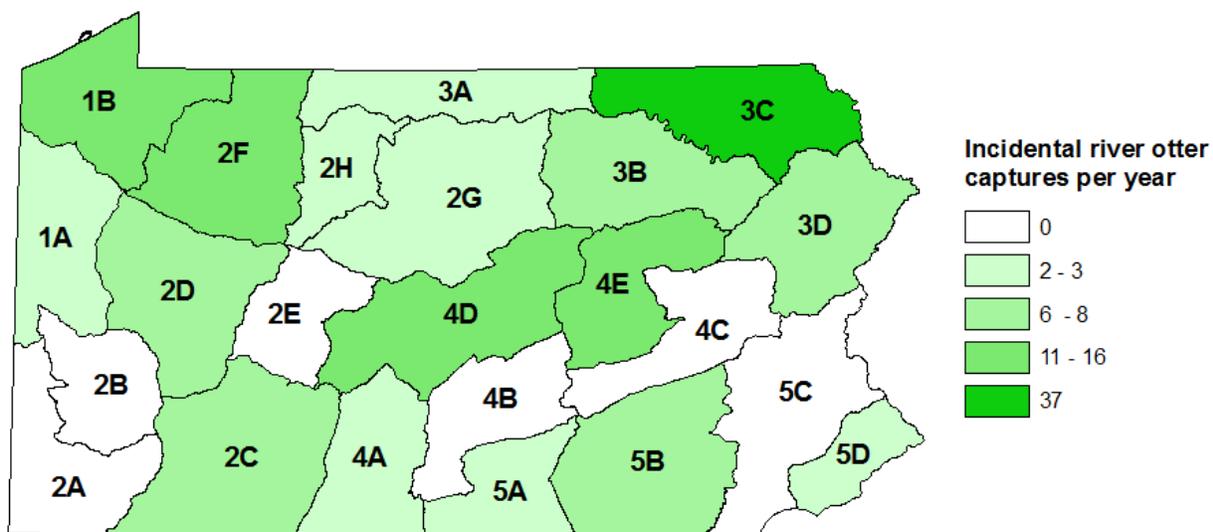


Figure 4. Average number of incidental river otter captures each year by Wildlife Management Unit during 2007-2012.

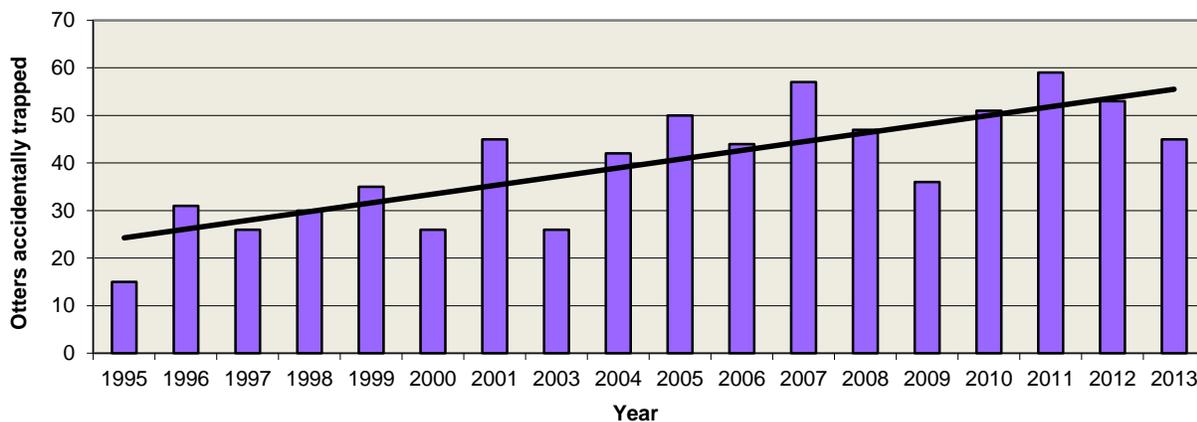


Figure 5. Incidental river otter captures reported by Wildlife Conservation Officers during 1995-2013.

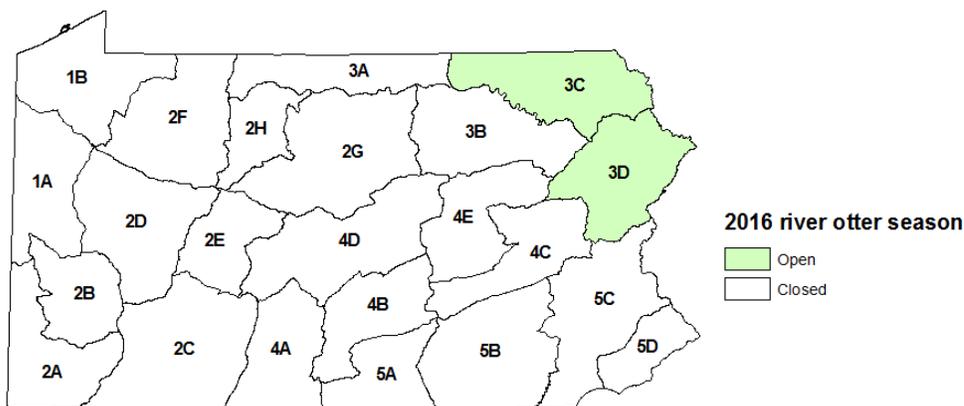


Figure 6. Proposed Wildlife Management Units open to otter harvest.