

YOUR STATE WILDLIFE AGENCY

# 2018 ANNUAL REPORT



# OPENING MESSAGE

Tracy Graziano

As the state's wildlife agency, the Pennsylvania Game Commission is focused on our mission; Manage Pennsylvania's wild birds, wild mammals, and their habitats for current and future generations.

The Game Commission works towards this mission on behalf of all citizens of Pennsylvania for all 480 species of wild birds and wild mammals. After all, wildlife belongs to all Pennsylvania citizens, and the Game Commission is the trustee responsible for managing these precious resources.

The 2018 Annual Report offers insight on the progress of the agency in fulfillment of our mission on behalf of all Pennsylvanians. The hard working, skilled, and dedicated professionals and our all-volunteer board of commissioners work every day to protect and enhance our wildlife resources.

Our hunters and trappers play a lead role in allowing the agency to manage wildlife. Hunters and trappers are the means the agency has to manage wildlife populations, and they provide the lion's share of the financial resources, which fund wildlife conservation in the state.

No doubt, there are tremendous challenges facing the agency. Wildlife disease represents one of the largest challenges to the agency's management efforts: chronic wasting disease in deer, white-nose syndrome in bats, and West Nile virus in grouse. Aging forests and changes in agriculture also negatively impact some wildlife populations.

However, the agency continues to demonstrate that these challenges can be met. You can witness successful habitat management on our 1.5 million acres of state game lands. On private lands, we have worked with our partners at Pheasants Forever to restore high quality pheasant habitats on our remaining Wild Pheasant Recovery Areas. And where we have been able to successfully restore these habitats, wild pheasants have thrived.

As Pennsylvanians we are all blessed to enjoy a rich diversity and abundance of wildlife. And the Pennsylvania Game Commission continues to push forward to ensure that future generations will be able to enjoy the same wildlife resources.



Board of Game Commissioners  
President Timothy S. Layton, left, and  
Game Commission Executive Director  
Bryan J. Burhans

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Jacob Dingel



Tracy Graziano



Jacob Dingel



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# PUTTING WILDLIFE FIRST

Managing 480 species of wild birds and mammals for current and future generations



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Photos by Jacob Dingel

## Grouse and West Nile Virus



Ruffed Grouse in Pennsylvania (9:10)

West Nile virus is increasingly implicated in population declines of ruffed grouse in Pennsylvania, however little is known about the West Nile virus transmission cycle in the remote woodland habitat occupied by this species. Nearly all mosquito surveillance efforts for the virus occur in areas around human habitations to monitor public health risk. This surveillance, however, may not provide information on the timing of emergence, vector(s), and prevalence of West Nile virus in forested settings. The Game Commission is working to better understand West Nile virus in grouse habitat, and how best to monitor and respond to this disease.

In 2017, mosquito surveillance was conducted at eight grouse habitat sites on forested sites of State Game Lands 176 on the Scotia Barrens in central Pennsylvania. Mosquitoes were collected on two subsequent days for 12 weeks from mid-June through mid-September. Mosquito collections from each trapping location and trap type were sorted by species, trap type, and collection day. Weekly pools of each species were tested for West Nile virus using reverse transcriptase polymerase chain reaction.

More than 15,000 adult mosquitoes, representing 25 species, were captured and identified. Eight species were recognized as vectors of West Nile virus, with *Culex restuans* being predominate, representing 22 percent of all adult mosquitoes in the summer sample. Pools of *C. restuans* tested positive for the virus beginning in mid-July, the same week in surveillance around human habitations in the area began showing positives. All other mosquito pools tested negative for West Nile virus. These preliminary data identified *Culex restuans* as the most-likely driver of West Nile virus in woodland habitats. Following up on this pilot study, research at additional sites statewide has been initiated to look for landscape barriers and thresholds to *Culex restuans* abundance, which Game Commission land managers and foresters can use to identify locations to manage for grouse habitat that are both avoided by this mosquito species and can be best taken advantage of by grouse.

## Peregrine Falcon Comeback

The peregrine falcon is the third of Pennsylvania's large predatory birds to progress in recovery from endangered status. The bald eagle and osprey had each been listed since the 1970s, and experienced dramatic recoveries in response to protection and improved environmental conditions. Both were removed from endangered and threatened protections because their populations are now secure. Following a statewide management and recovery plan, the peregrine falcon population has also grown to this more secure position and the agency proposed a change from endangered status, to threatened.





## Elk Forage Preferences

Habitat managers need to be as efficient as possible in devoting time and resources to improve elk habitat. Understanding which species of forage are most preferred by elk will enable managers to develop guidelines that can be implemented seasonally or annually to maximize enhancement and maintenance of elk habitat. In 2018, the Game Commission initiated a research project aimed at determining the most preferred species of forage. Approximately 10 acres at four sites within the elk management area were prepared and planted with 12 unique forage species. Over the course of several years, trail cameras will record which forage species are most selected by elk. Researchers also periodically clip, dry, and analyze samples of the various forage types to measure nutritional value and palatability. Combined, these data will help identify not only which species of forage are most preferred by elk, but also the nutritional motivation behind those preferences.

## White-tailed Deer Fawn Survival and Predators

From 2000 to 2001, the Game Commission conducted one of the largest white-tailed deer fawn survival studies in North America. The results from that study showed that about half of fawns survive through the hunting seasons. Predators — including bears, coyotes and dogs, and bobcats — were the number one cause of mortality in forested areas. In response to continued concerns about predator impacts on deer populations, the Game Commission conducted a similar study from 2015 to 2017. The results of the second study demonstrated an important stability in fawn survival and predation. This stability benefits Pennsylvania’s deer management efforts by making the results of management actions more predictable.

Management implications of these studies include:

- Fawn survival was similar for both studies (15 years apart) — about half of fawns survive through hunting season
- Bears and coyotes remain the top causes of mortality for fawns in forested areas
- As available agricultural lands increase, fawn survival increases
- Fawn survival rates are sufficient for sustainable deer populations in Pennsylvania’s forested areas

### Percent Fawn Survival over time



## Breeding Waterfowl Surveys

Until the 1980s, most U.S. waterfowl hunting seasons were set based on aerial surveys of the Midwestern prairie “duck factory.” However, banding studies showed that most waterfowl harvested in the Northeastern states originate locally or from eastern Canada — not the prairies. With mountainous terrain, urban development, and forest cover making aerial surveys impractical in the Northeast, a ground-based Atlantic Flyway Breeding Waterfowl Plot Survey was initiated in 1989 and continues today, covering the area from New Hampshire to Virginia and providing the duck and goose population estimates needed to set appropriate waterfowl seasons for the eastern U.S. As part of this survey, more than a dozen Game Commission biologists pull on hip boots and fan out across the Commonwealth from mid-April to early May each year. Plot locations cover a random cross-section of all habitat types to ensure accurate estimates. Statewide, of 327 plots (each plot is one square kilometer), about one-third contain no wetland habitat and automatically receive a zero count; the rest are thoroughly field checked once annually. In 2018, Pennsylvania population estimates from this survey included 119,000 mallards, 96,500 wood ducks, and 232,000 Canada geese, along with lower numbers of black ducks, blue- and green-winged teal, common and hooded mergansers, and mute swans. Throughout the long term for the entire Northeast survey area, mallards and black ducks have declined, with wood duck trends stable to slightly increasing. Canada goose numbers increased dramatically during the 1990s but have been relatively stable during the past decade.



## Mange in Black Bears

Mange refers to a group of parasitic diseases of the skin in wild and domestic mammals caused by multiple species of mites. In free-ranging bears, mange is generally a sporadic problem involving only a few individuals. However, in Pennsylvania, mange in bears began occurring more regularly beginning in the early 1990s, and the number of clinical cases has since expanded in number and distribution. In fact, sightings of bears with mange are now occurring in other mid-Atlantic states. It is unclear if this apparent increase reflects an expanding bear population — more bears naturally means more sightings — or if changes in the disease, parasite, or host are affecting transmission, or both. Despite the current level of cases seen in Pennsylvania, the Game Commission does not believe mange is having a population-level effect because bear numbers remain at record highs. The progression of mange in Pennsylvania’s bear population has made it an emerging research priority for the Game Commission.

During the past five years, the agency has partnered with researchers at Indiana University of Pennsylvania, University of Georgia, U.S. Department of Agriculture, and most recently Penn State University to study various aspects of this disease. Some of this research has been groundbreaking, and results are expected to help shape future operating procedures. For example, the University of Georgia is studying how long mites survive in the environment. The current Penn State University study focuses on effectiveness of treatment for free-ranging bears, survival with and without treatment, reinfection rates, the effects of mange on travel patterns, and how the occurrence of other diseases or parasites (e.g., ticks) might influence susceptibility. Trapping began in May, 2018, to radio-collar 36 bears, some with mange and some without to use as control comparisons. The collars will record location information every two hours for three years. In addition to telemetry data, a host of biological samples from every bear handled is also being collected. By fall of 2018, 24 of the 36 radio-collars had been deployed.





Jacob Dingel

## Understanding Changes in Muskrat Populations

Muskrat populations have been declining throughout the Northeastern states for decades and Pennsylvania is leading the charge with recent initiatives to determine the cause.

In Pennsylvania, trappers harvested 300,000 to 450,000 muskrats annually throughout the 1970s and early 1980s. During the 2017-18 trapping season, trappers harvested just under 25,000 muskrats, the lowest harvest ever produced in the Commonwealth. The Game Commission has initiated an integrated approach to investigate these trends.

Comparisons of muskrat harvest data from the 1980s to those from recent years suggest that reproductive rates have not changed, but that fewer juvenile muskrats are surviving to become reproductively viable adults. Muskrats are currently being captured and equipped with radio transmitters to assess movements, survival rates, and cause-specific mortality factors. The Game Commission has increased disease surveillance and initiated toxicology and contaminant assessments to better understand potential environmental impacts on muskrat populations. Pennsylvania trappers will be providing biological samples this fall and winter to bolster these investigations.

The agency is replicating trapper surveys that were conducted in the 1980s to assess changes in trappers' perceptions of muskrat population trends as well as potential causes for declines. These surveys will allow a comparison of muskrat harvests from various wetland habitat types in the 1980s to those from recent seasons and could provide valuable insights for the management of this wetland furbearer.



Greg Turner

## Protecting the Remaining Bats

A long-standing conservation measure to protect bats is more important than it has ever been. Gating caves and mines to limit public entrance is a critical step to help bats survive long winters. Since white-nose syndrome decimated local hibernating bat populations, providing them a secure winter's rest is essential. Already stressed by resisting white-nose syndrome, a gated cave prevents the inadvertent disturbance of human recreational activity underground.

During this past year, the Game Commission completed bat gates at three sites: State Game Lands 51 in Fayette County, the Sabula Railway Tunnel in Clearfield County, and Huntingdon County's Indian Caverns, an historic bat hibernaculum recently protected through a partnership with the Western Pennsylvania Conservancy, the Pennsylvania Fish and Boat Commission, and the U.S. Fish and Wildlife Service.

This cupola gate on the top vent of Indian Caverns allows heat to exit the cave while preventing human entry.

## Managing the Spread and Prevalence of Chronic Wasting Disease

As part of the agency's ongoing Chronic Wasting Disease surveillance, the Game Commission collects samples from deer harvested across the state to test for Chronic Wasting Disease (CWD). Within the state's disease management areas (DMAs) — areas where CWD has been detected in captive or free-ranging deer — intensified sampling occurs. Additional surveillance efforts include sampling road-killed deer, clinical suspects, and escaped captives.

During the 2017-18 deer hunting seasons, the Game Commission offered free CWD testing for hunters harvesting deer within disease management areas. This provided the Game Commission with more samples to better understand the extent of the disease.

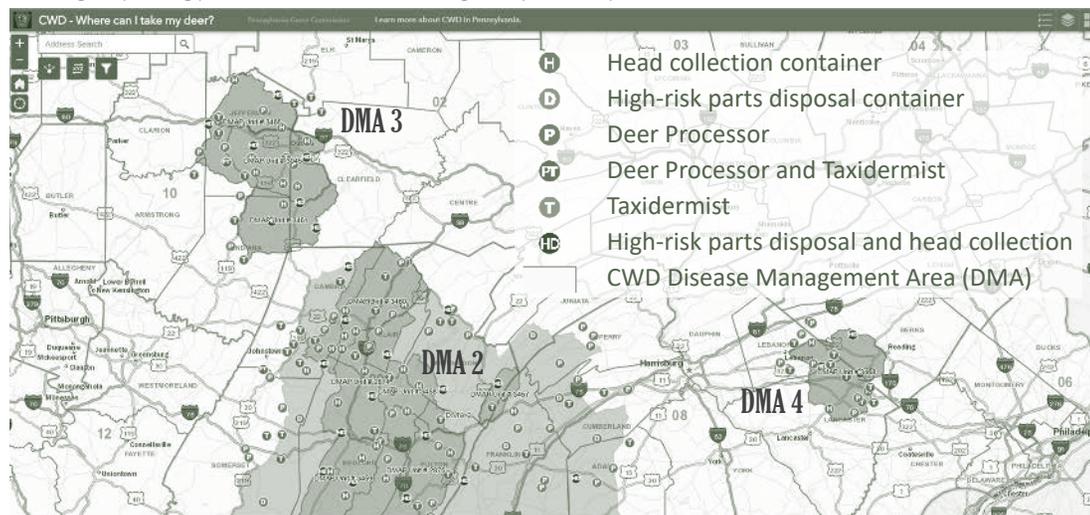
In 2017, the Game Commission tested 7,911 deer for CWD, of which 79 tested positive. The majority of these positives were detected within DMA 2; however, three positives were detected in free-ranging deer in DMA 3. As of June 30, 2018, the Game Commission tested an additional 1,367 deer for CWD since the beginning of the year, of which 27 tested positive. All 27 positives were detected in DMA 2.

CWD is not a new disease; the disease is currently detected in 25 states and three Canadian provinces. It was first detected in Pennsylvania in 2012 in a captive deer facility in Adams County. Shortly after, it was detected in three free-ranging deer in Bedford and Blair counties. As of June 30, 2018 a total of 157 free-ranging deer had tested positive for CWD in Pennsylvania. The Game Commission continues to monitor CWD throughout Pennsylvania to find and manage CWD where it exists.

CWD is spread through direct or indirect contact, with prions (misfolded proteins) shed in saliva, urine, and feces of infected animals. This disease attacks the brains of infected deer and elk inevitably leading to death. There is no approved live-animal test for CWD and there is no known cure. While there is no evidence that CWD can be transmitted to humans, it is recommended humans avoid consuming meat from CWD-infected animals.

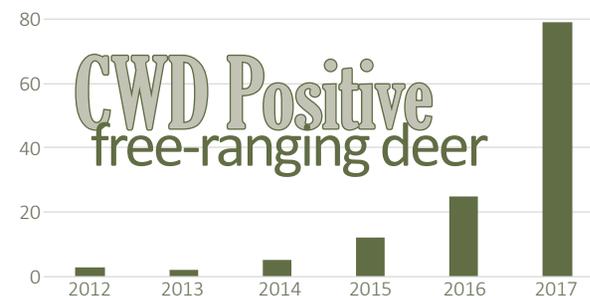
For more information on CWD, regulations pertaining to CWD, or options for hunters to get their deer tested, visit the Chronic Wasting Disease page of the Game Commission's website, <http://bit.ly/PGC-CWD>.

The CWD Disease Management Area Map identifies disease management area boundaries and locations of CWD services including cooperating processors and taxidermists, high-risk parts dumpsters, and head collection containers.



Chronic Wasting Disease (3:54)

The escalating number of CWD detections and the emergence of this disease in new parts of the state should put all Pennsylvanians on guard to the threat that CWD poses and the disease's potential to have damaging impacts on Pennsylvania's deer and deer-hunting tradition.



# MANAGING WILDLIFE HABITAT

State game lands — 1.5 million acres and counting



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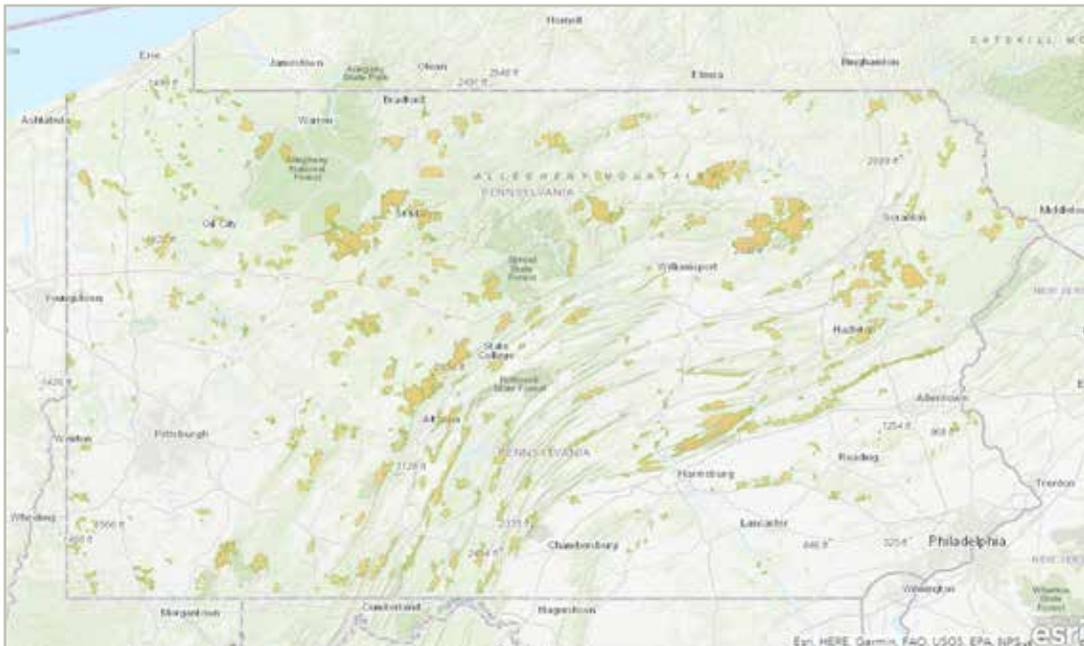
## State Game Lands

 Pennsylvania State Game Lands (17:04)

The Game Commission has a staunch commitment to conserving Pennsylvania's open places. Its 1.5 million-acre system of state game lands provides habitat for wildlife, hunting and trapping opportunities for license buyers, and opportunities for wildlife viewing. State game lands continue to be one of the Commonwealth's most-valued assets. The agency passed the 1.5 million-acre milestone during 2015. In addition to lands purchased with the revenue of generations of license-buying hunters and trappers and many partners, beginning in 1937 as a federal excise tax of sporting arms and ammunition, Pittman-Robertson federal funding has helped finance the acquisition of roughly 190,000 acres of state game lands.

During the 2017-18 fiscal year, 4,299 acres were added to the game lands system including two interiors, one indenture, and seven acquisitions to improve access into existing game lands. Donations from five landowners contributed 463 acres. While the agency continues to work with many conservation partners to acquire land, the following partners were instrumental in successfully adding acreage to the state game lands system during fiscal year 2017-18: Northcentral Pennsylvania Conservancy, Inc.; the Rocky Mountain Elk Foundation; the U.S. Fish and Wildlife Service; Wildlands Conservancy, Inc.; and the Western Pennsylvania Conservancy.

Within the 1.5-million-acres state game lands system there are 308 separate game lands in 65 of the Commonwealth's 67 counties. The agency maintains approximately 3,900 miles of road, 360 buildings, 29 public shooting ranges, 38,000 bridges and culverts, and around 1,500 ponds and dams on these lands.



Derek Stoner

Jacob Dingel

Local governments received \$1,800,665 in payments from the Game Commission to counties, school districts, and townships in-lieu-of taxes on state game lands during fiscal year 2017-18.





## Howard Nursery

More than 7,900 nesting structures and 526,000 seedlings — including 164,075 seedlings for schools — were distributed from the agency's Howard Nursery to improve wildlife habitat statewide during fiscal year 2017.



Hal Korber

## Hunter Access Property

More than 13,000 landowners and tenants are taking advantage of the mutual benefits provided by the agency's Hunter Access Program. The properties cover more than 2.2 million acres on more than 13,000 parcels of private lands located in most of the state's 67 counties. Since this program's creation more than 80 years ago, participating landowners have found relief from the damage game animals and furbearers can cause and protection from law breakers. The program is appealing to both hunters and property owners; hunters have more lands where public hunting is allowed, and landowners have more options to manage their property's game populations through hunting, trapping, and habitat enhancements.

During fiscal year 2017-18, using federal grant funds obtained through the 2014 Farm Bill, the Game Commission directly impacted more than 2,000 acres of participating properties through wildlife habitat improvements. A grant-funded economic analysis performed by Southwick Associates estimated the Hunter Access Program contributed a total of \$142.9 million in output and \$74.4 million in value-added contributions, supported 1,238 jobs and \$49.2 million in wages, and projected \$18.6 million in tax revenue.

## Environmental Planning

During fiscal year 2017-18, approximately 918 environmental reviews were completed to evaluate projects with potential impacts on threatened or endangered bird or mammal species, species of special concern, and critical or unique habitats. Projects included: 206 related to energy development and delivery including one power plant, 203 related to construction and land development, 99 related to timber harvests and forest planning, 77 related to agriculture, 69 related to habitat conservation, 46 related to waste water, 46 related to mining, 38 related to in-stream/riverine activities, 33 related to recreation, 29 related to transportation, 24 related to communication, 22 related to hazardous waste clean-up, 16 related to water extraction, 7 related to pest control, 2 related to vegetation management, and 1 related to a sewage facility.

An additional 149 mining permit applications were reviewed for mine operators in attempt to avoid or minimize impacts to wildlife and wildlife habitats associated with potential mining operations. Reviews also provide input on site reclamation to enhance wildlife habitat.

Tracy Graziano

## Forests, Oil, Gas, and Minerals on State Game Lands

Forests require regular attention to ensure the best habitat for the greatest variety of wildlife. During the 2017-18 fiscal year, 9,119 forested acres were harvested to improve habitat on state game lands, an increase of more than 500 acres above the previous year. Associated services in lieu of cash from timber sales included 7 miles of new haul roads, 97 miles of improved roads, 136 culverts placed, 2 new stream crossings, 7 new or improved parking lots, 11 new gates, and 225 acres of new manageable openings of non-woody plants.

Herbicides were used to treat 5,721 acres, and non-commercial habitat improvement projects occurred on 1,429 additional acres, including regeneration treatments, crop-tree releases, and pre-commercial thinning. Deer fencing was removed from 1,083 acres.

The agency manages 134 oil, gas, and mineral agreements encompassing approximately 173,736 acres for development of oil, gas, coal, and minerals on state game lands. Since 2010, a total of 85 well pads for unconventional well drilling operations have been developed on state game lands creating a surface impact of approximately 1,084 acres. Of those well pads, 47 have been developed on acreage where the Game Commission does not own the oil and gas rights, and 38 pads have been developed under acreage where the Game Commission does own the oil and gas rights.

## Controlled Burns on State Game Lands

Controlled burning is an important and cost effective tool to manage game lands and Hunter Access properties. It is a management tool useful in a variety of habitats from grasslands to oak forests. During fiscal year 2017-18, trained personnel used controlled burns on 9,257 acres, nearly 86 percent of which was forested habitat.

Controlled burns improve wildlife habitat and hunting opportunity by increasing soft-mast production in shrubs such as blueberry, huckleberry, and blackberry; rejuvenating succulent browse plants preferred by deer and elk; promoting oak habitats and their vitally important acorns; and maintaining grasses and broad leaf plants sought by brooding turkeys and grouse.

Controlled burns are conducted under specific weather and “fuel” conditions to ensure fires of low to moderate intensity. Fuel refers to the dried leaves, grasses, and brush that are consumed in the fire. Burns often reduce the risk of wildfires. Controlled burns are conducted by crews that are highly trained to ensure safety, both for themselves and the public.

Ignition patterns are designed to provide wildlife with escape routes as the burn progresses. From fawns to turtles, even the slowest wildlife can reach safety. Before the smoke clears, animals often are seen returning to burned areas. Because the most controlled burns occur in spring, people are often concerned about impacts to ground-nesting birds such as turkeys and grouse. While burns may disrupt a few nests, hens often re-nest and some nests in the burn area may not be harmed. Most importantly, burns occur on less than 10 percent of the landscape. Direct impacts are quite small and the benefits to wildlife from using controlled burns as a management tool far outweigh potential negatives.

# Controlled Burn Acres by calendar year



Photos by Hal Korber



# PROTECTING OUR WILDLIFE

Pennsylvania's wildlife is a worthy investment



## Wildlife Protection

Game wardens conducted 180,380 enforcement contacts during fiscal year 2017-18, a decrease of more than 14,000 from the past fiscal year and more than 31,000 from 2015-16. The agency initiated a total of 6,617 prosecutions within the Pennsylvania court system, a reduction of nearly 900 from the prior fiscal year and nearly 2,000 less than 2015-16. Of the 6,617 prosecutions, 6,395 were successful, 222 were unsuccessful, and 633 were withdrawn or dismissed, giving the agency a 96.6 percent prosecution rate for the fiscal year. Game wardens gave out 11,421 warnings for a ratio of almost two warnings per citation.

A total of six citizen complaints against officers, resulting from five separate incidents, were received and adjudicated during the 2017-18 fiscal year. After investigations, three were exonerated, one was not sustained, one resulted in no finding, and one was found to be a violation of agency standard operating procedures.

## State Game Wardens



Game Wardens-Serving Beyond the Season (10:06)

For the first time in its 122-year history, the Pennsylvania Game Commission is calling its law-enforcement officers “state game wardens.” The change took effect Jan. 1, 2018. Since the recodification of the state’s Game and Wildlife Code in 1987, field officers were titled wildlife conservation officers. Prior to that, they were called district game protectors.

While wildlife law enforcement is a core responsibility, fulfillment of an officer’s full range of duties requires significant training and responsibility. Their duties extend into wildlife surveys, wildlife trap-and-transfer, field research, and providing conservation and education programs, including Hunter-Trapper Education, to civic groups and public schools. They also represent the agency at conservation and sportsmen’s club meetings, and respond to nuisance wildlife complaints, reports of injured wildlife, and calls about wildlife suspected to be rabid.

Game wardens are sworn peace officers with statewide law-enforcement authority. They are highly trained and equipped as well as any police officer. They are expected to know and follow standards for protecting civil rights, gathering evidence that will hold up in court, and prosecuting violations of many different laws. There is no “off” season. Being a game warden requires a very unique person willing and able to develop a diversity of skills.

During fiscal year 2017-18, 317 deputies (down from 340) assisted 108 full-time game wardens. Two game warden districts were combined changing the number of districts from 136 during the past fiscal year to 135. At the end of the year, 33 of the agency’s 135 districts were vacant. Six wardens were on special assignments and 102 wardens were covering all 135 districts. The average district encompassed roughly 325 square miles.

On March 4, 31 cadets reported to the Ross Leffler School of Conservation to begin 50 weeks of training to become state game wardens. The residency-style academy includes instruction on all essential functions and duties of Pennsylvania’s state game wardens. In September cadets began 10-week field training assignments under the supervision of salaried game wardens across the state for valuable on-the-job training. Cadets who graduate in February of 2019, will be assigned to serve a vacant district. In January of 2019, the agency plans to announce the opening of the civil service exam for the 32<sup>nd</sup> class of state game wardens.



Jacob Dingel

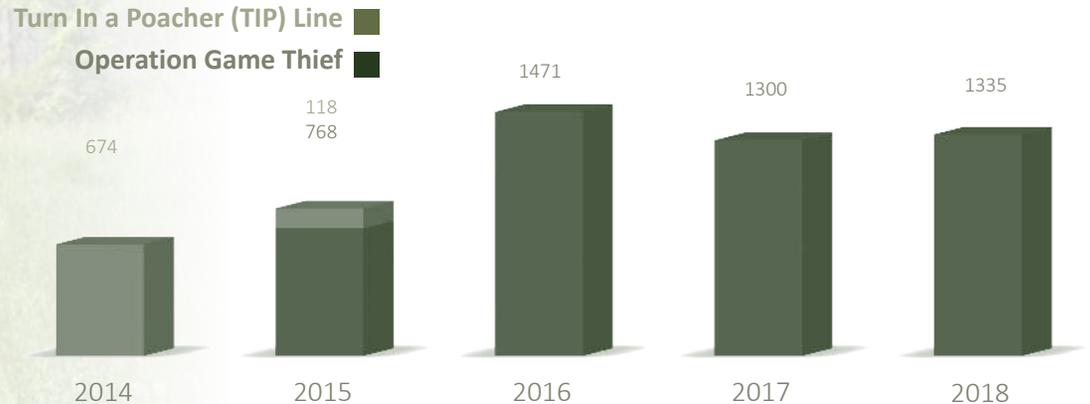


Hal Korber

Joe Kosack



# Tips reporting wildlife crimes



## Operation Game Thief



In the fall of 2015, the Game Commission transitioned to receiving wildlife crime tips through Operation Game Thief. The system has increased the ease and efficiency to confidentially report tips about wildlife crimes. During the 2017-18 fiscal year, 1,335 calls were received. The hotline continues to resonate well with the public and maintains an average time of around 20 minutes from when a tip comes in until an officer is dispatched to the incident.

Report wildlife crimes by calling the Operation Game Thief toll-free hotline at 1-888-PGC-8001 or filling out an online form available from the Game Commission's home page at [www.pgc.pa.gov](http://www.pgc.pa.gov) or from the Operation Game Thief page at <http://bit.ly/PGCOGT>.



## K-9 Unit



The Game Commission's K-9 program was re-established in 2015. Since then, the agency's three Labradors and their handlers have been hard at work. The teams aid game wardens in locating and retrieving physical evidence related to game law violations statewide. During fiscal year 2017-18, the teams were deployed 120 times and completed 275 investigations. The call volume for the K-9 teams has increased every year. Call volume from other agencies requesting the Game Commission's K-9 teams has increased as well. In one case, the Ohio Department of Natural Resources requested a K-9 team to assist in a hunting-related shooting incident. The K-9 team was able to locate evidence linking a suspect back to the scene of the crime.



Tracy Graziano

## Top 10 violations 2017-18



The Top 10 wildlife crime violations during fiscal year 2017-18 were similar to those of the previous fiscal year with these exceptions. Back in the Top 10 were hunting or trapping without the required license and safety zone violations. Falling from this year's Top 10 were using a state game lands shooting range without the proper license or permit and spotlighting violations.



# PROMOTING OUR HERITAGE

Proven leaders in conservation, hunting, and trapping

Joe Kosack



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## Wild Turkey Population Rising

The 2018 statewide turkey population was estimated at 228,800, an increase from 216,800 in 2017. This is 5 percent above the previous 3-year average (218,600), and 4 percent above the previous 10-year average (220,100). With annual fluctuations in population size, the challenge is to match hunting opportunities with harvest potential. Pennsylvania's turkey population reached a peak abundance of about 280,000 birds during the early 2000s, following restoration efforts involving trap and transfer of birds, habitat improvement, and fall turkey hunting season restrictions. The population subsequently declined sharply to levels below 200,000 before rebounding since 2011.



Pennsylvania's wild turkey population over time

## Wild Turkey Seasons Offer Variety and Opportunity

Every licensed hunter is issued one fall turkey tag and one spring turkey tag. Spring turkey hunters have the option of purchasing an additional tag.

Fall season length varies by wildlife management unit, from a closed season to a nearly four-week season, in order to maximize both turkey populations and hunter opportunities. Mentored hunters (youth or adult) may harvest a fall turkey using their mentor's fall harvest tag.

The highest percentage of fall harvests occur during the first week of the season, while the 3-day Thanksgiving season comprises approximately 20 percent. Fall season lengths were shortened in three wildlife management units by one week, and the fall season was opened in one wildlife management unit. The fall harvest of 9,266 was the second consecutive record low and was 37 percent below the previous 3-year average (14,718). Shorter seasons, an abundant mast crop in many parts of the state that dispersed the flocks making them more difficult to locate and decreasing hunter participation, and carryover effects of below-average reproduction contributed to lower harvests.

The statewide spring bearded-bird-only season opens the Saturday closest to May 1. A 5-year study (2010-14) of 254 satellite-transmitted hen turkeys determined this date to be around the peak of nest incubation. The half-day, Saturday, youth season is one week prior to this regular spring season opener.

The special spring turkey license continues to grow in popularity since its inception in 2006, and in 2018 a record 20,925 special spring turkey licenses were sold. The success rate for hunters' first spring turkey has averaged around 16 percent, in 2018, success jumped to 20 percent. While only 22 percent of special license purchasers hunted for a second turkey, 65 percent were successful.

The 2018 spring harvest of 40,303 was a 5 percent increase from the previous 3-year average (38,416) and included 2,048 during the youth season (including mentored harvest), 571 mentored youth during the regular season, 33,622 adults and licensed youth during the regular season, and 4,062 second harvests. Since 2006, when the season bag limit was increased to two with purchase of the appropriate license, spring harvests have ranged from 33,849 (2010) to 44,639 (2009).

## Terrific Turkey Hunting in Pennsylvania

When comparing Pennsylvania's spring turkey harvest to other Northeastern states — Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont, Virginia, and West Virginia — from 2013 through 2017, Pennsylvania's average spring harvest of 38,600 turkeys made up 34 percent of the total average spring harvest of all Northeast states combined (113,100). The states with the next largest average spring harvests were New York and Virginia, each with 17 percent (approx. 18,700 birds each) of the total spring harvest.

When comparing average fall harvests of the same period, Pennsylvania's 14,040 birds comprised 54 percent of the total average fall harvest of all the Northeast states (26,150). The state with the next largest fall harvest was Virginia with 13 percent of the total fall harvest (3,400 birds).

- Connecticut
- Maine
- Maryland
- Massachusetts
- New Hampshire
- New Jersey
- New York
- Pennsylvania
- Rhode Island



Pennsylvania made up 52 percent of the total fall harvest for all Northeastern states in 2017.



Jacob Dingel

Laurel Shipman, 2017,  
Lycoming County.

## Recruiting, Retaining, and Reactivating Hunters

Trends in hunter participation and license sales show major changes underway in the hunting community in Pennsylvania and nationwide. The No. 2 state in the country (behind Texas) for the total number of hunting licenses sold, Pennsylvania is dependent upon hunting license dollars to support not only the agency's mission as a hunting-focused organization, but also to fund diverse projects dedicated to habitat enhancement, endangered species protection, and wildlife restoration.

The millennial generation, defined as those individuals born between 1982 and 2000, comprises more than 83 million and is the largest generation ever in the United States, surpassing the 76 million Baby Boomers born between 1946 and 1964. National hunter participation surveys identify millennials as the largest source of new hunters, and a significant pool of potential participants in hunting-focused programs.

Sales of Junior Hunting licenses have declined more than 40 percent in the past decade, despite a robust Hunter-Trapper Education program that graduates more than 25,000 youth annually. The traditional model of hunter education continues to draw significant numbers of participants but does not currently translate to increased license sales for those under the age of 16. During the same decade, sales of Resident Adult licenses decreased 13 percent. One of the biggest factors stated in surveys of new hunters is the need to develop enough knowledge and skill to be comfortable being active as a licensed hunter.

New initiatives are underway in Pennsylvania to provide mentored hunting experiences and support for those wanting to get started in hunting at any age or stage in life. To address the need for qualified adult mentors, the agency enrolled in the National Hunter Mentor Program, a comprehensive curriculum created by the International Hunter Education Association and Pheasants Forever. Game Commission staff and volunteer Hunter-Trapper Education instructors are being trained in the Hunter Mentor model and will be training new Hunter Mentor instructors who will grow the program statewide.

## Big Game Scoring Program

Though most of us do not go hunting for the purpose of taking a record-book trophy, record-book animals bring to attention the excellence of habitat and wildlife-management practices that help produce healthy wildlife populations.

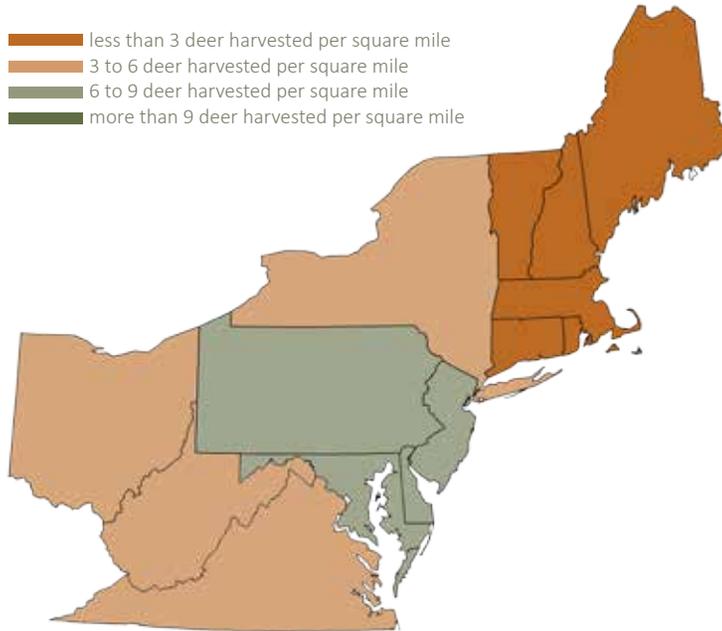
During the past eight years, more than 950 deer entries — 174 last year alone — have been added to Pennsylvania's Big Game Records listings. Bradford County again was the top producer of record-book bucks, a distinction the county has held for some time. There's little doubt antler restrictions have paved the way for the addition of these immense bucks to the deer herds that roam the hills of our Commonwealth.

Twenty-seven bears, including four taken with archery gear, were added to Pennsylvania's Big Game Records book in 2018. The largest new bear entry in Pennsylvania's records was taken with a crossbow in Schuylkill County in 2017. Its skull measured 22-9/16 inches to take over the No. 1 spot in the archery category. It is currently the 13<sup>th</sup> top-scoring Pennsylvania bear on record.

Ten bull elk taken in 2017 were added to the state's records. A trophy elk scoring 421-0/8 inches taken in Centre County was added to the nontypical firearms category in the 2018 record book, and was the largest bull taken in 2017.

## Deer Harvest Density

Deer harvest densities in Pennsylvania and nearby states remain similar to last year with the exception of New Jersey, which rose from the *three to six deer harvested per square mile* category back to the *six to nine deer per square mile* category.



## Premier White-tailed Deer Hunting

Pennsylvania is one of only five states in the U.S. to harvest more than 300,000 whitetails annually. During the 2017-18 deer seasons, hunters took an estimated 367,159 deer, an increase from the 2016-17 harvest of 333,254. These success rates are higher than those in recent years. Hunter success in 2017-18 rose from 16 percent (2016-17) to 18 percent of all licensed hunters taking a buck and 26 percent (up from 24) of antlerless licenses issued being filled.

During the 2017-18 seasons, 38 percent of the state's overall buck harvest — 62,830 — was harvested with archery equipment. Hunters using crossbows took 62 percent of the archery bucks harvested. This demonstrates the increased popularity of crossbows as more hunters are using crossbows than vertical bows.



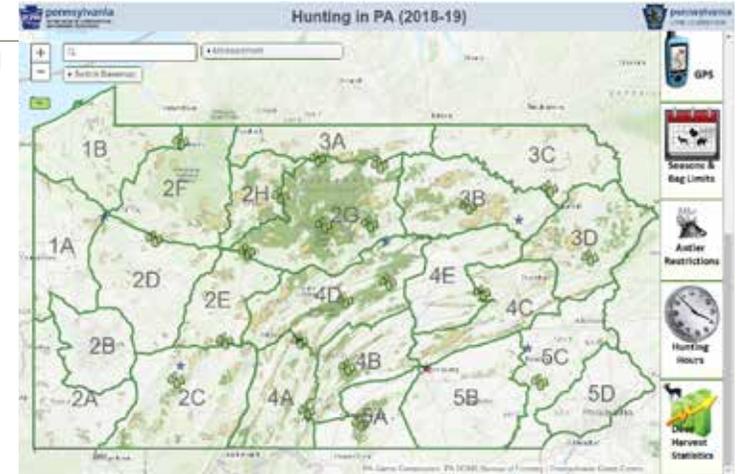
Jacob Dingel



Hal Korber

## Mapping Tools for Hunters

The Game Commission worked on several big GIS projects this past fiscal year including a CWD Disease Management Area map that makes it easy to identify Disease Management Area boundaries and locations of various CWD services including cooperating processors and taxidermists, high-risk parts dumpsters, and head collection containers. Hunters also will find useful the new *Hunting in PA* interactive map created with the Department of Conservation and Natural Resources available at [www.hunting.pa.gov](http://www.hunting.pa.gov). The map offers information on hunting hours, antler restrictions, seasons and bag limits, deer harvest statistics, and more.



## Wild Pheasant Hunting Returns

November 2017 marked the return of wild pheasant hunting to Pennsylvania. Wild pheasants disappeared from the Commonwealth in the latter part of the 20th century due to habitat loss. In 2008, the Game Commission initiated a 10-year research project and restoration effort that focused on restoring grassland habitat within five wild pheasant recovery areas, translocating wild birds from South Dakota and Montana, and monitoring the results. Although success varied, the Central Susquehanna Wild Pheasant Recovery Area in Montour, Northumberland, and Columbia counties proved to have the right ingredients. Once again residents are hearing and seeing pheasants, and re-opening hunting on a limited basis was an exciting milestone.

A random drawing was held to select 48 youth (from hundreds of applicants) to participate in the first wild pheasant recovery area youth hunt. Two weekends in November were selected for the hunt and pairs of young hunters were assigned a volunteer mentor to safely guide their hunt using top-notch bird dogs and years of experience. Each group experienced fantastic pheasant habitat and flushing roosters. Nearly every hunter had the opportunity at a wild rooster, and five were harvested during the two days of hunting.

## Pheasant Stockings Near Previous Levels



The Game Commission provided enhanced hunting opportunities for junior hunters by releasing 15,550 pheasants for statewide junior pheasant hunts at designated, advertised sites. Another 1,038 birds were distributed to 27 club-hosted hunts for 515 junior hunters.

During the regular fall season, 142,310 birds were stocked in the pre-season and four in-season releases. An additional, 8,745 hens were released for the late small game season within wildlife management units open to harvest both male and female pheasants.

## Game Commission Science Ranks High

A recent article in the journal *Science Advances* evaluated the scientific basis of hunt management plans for 27 groups of game species across 62 North American jurisdictions (U.S. states and Canadian provinces). The authors reviewed a total of 667 management plans for the presence of four “hallmarks of science” (measurable objectives, evidence, transparency, and independent review) using 11 specific criteria. The number of criteria included in a given management plan can be considered a “scientific score” for the plan.

The results reveal some encouraging statistics for the Game Commission’s species management plans. The overall average score for the 14 Pennsylvania plans evaluated (7.21) placed second to Washington state (7.75). Rounding out the top five were Maine (6.94), Iowa (6.29), and Utah (6.14). Pennsylvania’s white-tailed deer management plan score of 10 tied for the top overall score with plans from Wisconsin (deer), Washington (mountain goats and bighorn sheep), and Montana (bighorn sheep). In addition to the deer plan, Pennsylvania’s black bear, beaver, fisher, wild turkey, and ruffed grouse plans all ranked within the top 10 percent of all plans evaluated.

Among individual species and species groups, Pennsylvania’s black bear management plan tied with four other states for the top score among plans for this species. Pennsylvania’s ruffed grouse management plan was the top-scoring plan among all 127 plans for small game upland birds. Among 108 plans for furbearers, Pennsylvania’s beaver management plan tied with Maine’s beaver plan for the top score and Pennsylvania’s fisher management plan tied with three other plans for the second-highest score. Pennsylvania’s wild turkey management plan ranked No. 2 (behind Minnesota) out of 54 turkey management plans.

Other accolades include the Pennsylvania Game Commission being named Quality Deer Management Association’s Agency of the Year in July of 2018. The agency was touted as providing a deer management plan and research program based on science and public input that has consistently received high approval from the public and hunters in surveys.



Jacob Dingel

Jacob Dingel



# INVESTING STRATEGICALLY

Building infrastructure for better business and long-term financial stability



## Redesigning the Pheasant Program



Pheasant hunting continues to be popular and is almost totally dependent on the Game Commission's production and release of pheasants each fall. The agency sees value in providing this upland game bird hunting opportunity for hunter recruitment, retention, and reactivation, during a time when wild pheasant and quail populations have disappeared, and grouse populations are down.

In the first year after closing two of the agency's four game farms and eliminating breeder flocks and hatchery operations, costs to produce birds were reduced another \$1 million from the previous year. The agency purchased 200,000 day-old chicks to meet the shipping goal for 2017.

The agency's two game farms produced 167,643 pheasants for the 2017 releases. According to the Game Take survey, 35,738 hunters hunted pheasants for 186,907 hunter-days last year. Despite a 50-percent reduction in production capacity through the closure of two farms, increased efficiency resulted in only a 20-percent reduction in production below the normal release goal of 200,000 birds.

The new pheasant hunting permit generated more than \$1.1 million to offset some program costs. Junior hunters and hunters who held their senior lifetime licenses prior to May 13, 2017 were exempted from permit purchase in 2017. More than 42,000 permits were sold and revenue was reinvested in the program. The day-old chick purchase was increased to 260,000, 75 percent being male rather than 52 percent the previous year, and the agency increased holding field capacities to increase the fall release goal to 220,000 birds for 2018.

A grant through the Pittman-Robertson program will help evaluate potential recruitment, retention, and reactivation benefits of the pheasant propagation program. The Game Commission will be reimbursed 75 percent of its costs for providing free permits to junior pheasant hunters in 2018 and for pheasants stocked during statewide and club-hosted junior pheasant hunts.

## Increasing Efficiency and Effectiveness with GIS

The agency worked on several big projects this year including a forestry application developed with Mason, Bruce & Girard, Inc. that replaces an outdated system, increasing efficiency and providing more information to assist staff in managing habitat.

Another application, developed in-house, is being used by staff members to plan and coordinate controlled burn activities. In addition to real-time data on the location of land resources important for fire safety, the application facilitates staff coordination during burn events, and provides hunters with a mapping tool showing locations of recent burns.

## Updating the Two-way Radio System

The Commission's migration to the PA-STARNet P25 System will improve the agency's two-way radio communications capabilities and save sportsmen's dollars by the decommissioning the legacy system. These improvements are a cost-effective use of evolving communication technology that will increase efficiency of operations and adhere to Governor's Office Management Directive 245.15 requiring all state agencies with two-way radio communication needs to migrate to the STARNet system.

## Engaging Citizens

The agency continues to deploy citizen-science applications to collect valuable data. The Bald Eagle Nest Survey was recently released to allow citizens to assist biologists in monitoring nesting activities of our Pennsylvania bald eagles.

## Managing Infrastructure

Within the 1.5-million-acres state game lands system there are approximately 3,900 miles of road, 360 buildings, 29 public shooting ranges, 38,000 bridges and culverts, and around 1,500 ponds and dams. Renovation, repair, and replacement of this infrastructure continues to be a challenge. Most projects are funded through Pittman-Robertson grants, other funding sources include grants from state and federal agencies and budget allocations from the Game Fund.

During the 2017-18 year, shooting range renovations took place at six ranges in Berks, Columbia, Cumberland, Lehigh, and Westmoreland counties. The improvements include overhead shelters and concrete walkways at the shooting stations, new shooting tables, steel target uprights, and better drainage. An archery range with concrete walkways was constructed in Montgomery County featuring targets from 10 to 40 yards and a 20-yard sandpit target for broadheads.

Two pavilions were constructed at the elk viewing areas in Elk County. And game lands access was improved with four major road projects on state game lands including a 1.52-mile long section of Hazard Road in Clinton County, a 1,000-foot section of Hartman Road in Blair County, a 2.99-mile long stretch of Lucy Furnace Road in Huntingdon County and a 1.47-mile long section of Killbuck Road in Cambria County. All road projects improved drainage and restored the driving surface. Sixteen new bridges were constructed and projects were completed on two dams.

Outdated and unused buildings have higher energy and maintenance costs and potentially unsafe conditions. Five buildings on game lands were demolished and removed during this time period. The pheasant pens and fences at the former Western and Northcentral game farms were also removed, and seven building renovations were completed.

Other projects include construction of four CWD ramps and dumpster pads in Fulton and Franklin counties and two more in the Michaux State Forest. The parking lots at the Southwest and Northcentral region offices were repaired and resurfaced. The loading dock at the seedling building at Howard Nursery was replaced and the parking lots and roads were resurfaced with a layer of stone. Automatic electric gates were installed on the self-guided tour road at Middle Creek Wildlife Management Area. And construction of the new Northeast Region Office, three habitat management crew headquarters buildings, and two storage buildings was completed.

# YOUR STATE WILDLIFE AGENCY



## Strategic Goals

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The Pennsylvania Game Commission exists to manage the Commonwealth's wild birds, wild mammals, and their habitats for current and future generations, a mission it has followed faithfully since 1895. Although its focus has remained static since the agency was created, the suite of challenges and opportunities facing the agency are fluid and dynamic. The agency is focused on the work ahead — adapting to challenges it faces using innovation to accomplish the task of protecting and promoting wildlife in Pennsylvania in the most efficient manner possible.

1. *Manage, propagate, and protect all of Pennsylvania's wild birds and mammals and put wildlife first in decision-making*
2. *Manage wildlife habitats*
3. *Serve the Commonwealth as the leader in wildlife conservation*
4. *Support Pennsylvania's hunting and trapping heritages*
5. *Operate using sound, proven business practices to ensure long-term financial stability, to sustain performance improvement and commitment to excellence*

## Mission

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To manage wild birds, wild mammals, and their habitats for current and future generations

## Vision

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To be the leader among wildlife agencies, and champion of all wildlife resources and Pennsylvania's hunting and trapping heritage

## Executive Staff

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Bryan J. Burhans, *Executive Director*  
Richard Palmer, *Deputy Executive Director*  
Thomas P. Grohol, *Deputy Executive Director*

## Board of Game Commissioners

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Timothy S. Layton, *President, Windber*  
James R. Daley, *Vice President, Cranberry Township*  
Stanley I. Knick Jr., *Secretary, Dupont*  
Scott H. Foradora, *Dubois*  
Charles E. Fox, *Troy*  
Dennis R. Fredericks, *Amity*  
Brian H. Hoover, *Oxford*  
Michael F. Mitrack, *York*

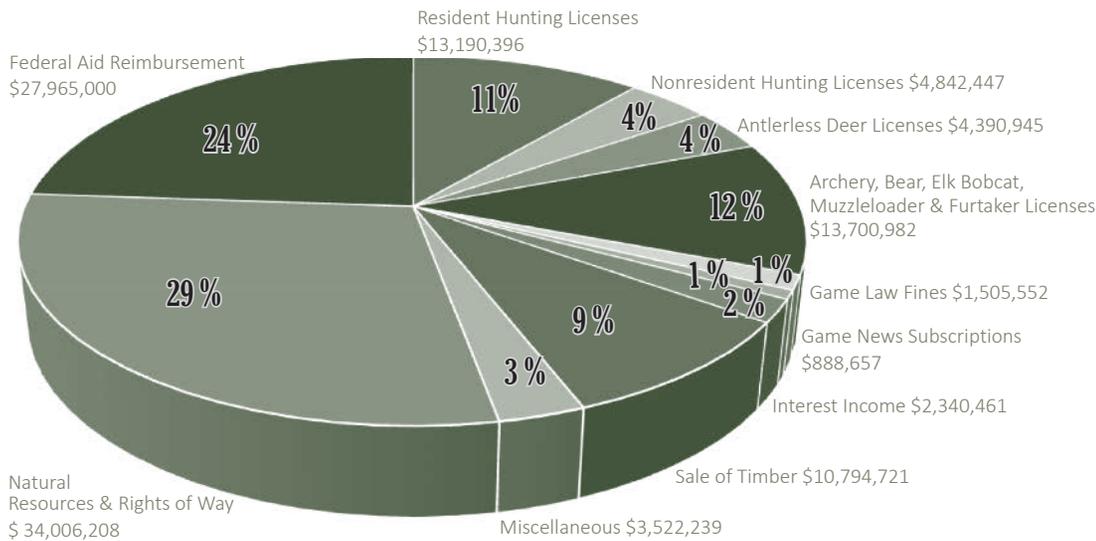
### **PARTNERS MAKE IT POSSIBLE:**

The agency is committed to being connected with its constituents and engages with its partners in actively conserving Pennsylvania's wildlife resources. While they are too numerous to name and only a few are mentioned in this report, we thank all the volunteers and organizations who help, for their persistent support and generosity in protecting and promoting the state's wildlife. Partners make it possible.

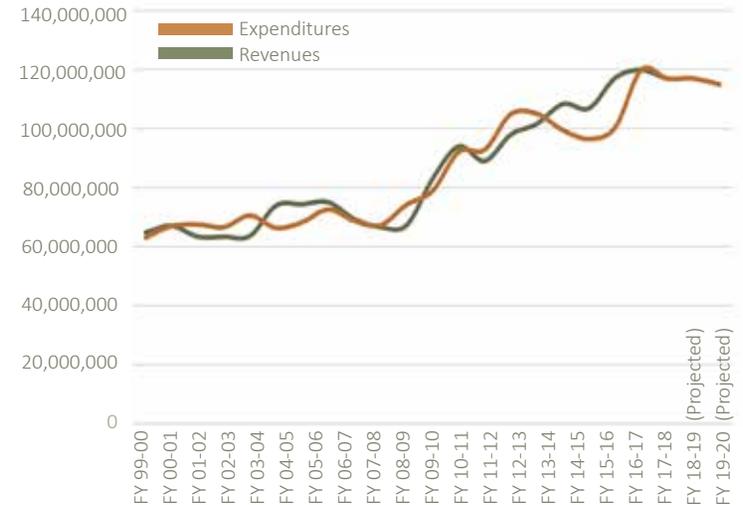
# GAME FUND REVENUES and EXPENDITURES

## Revenues—\$117,147,608

Fiscal year ended June 30, 2018

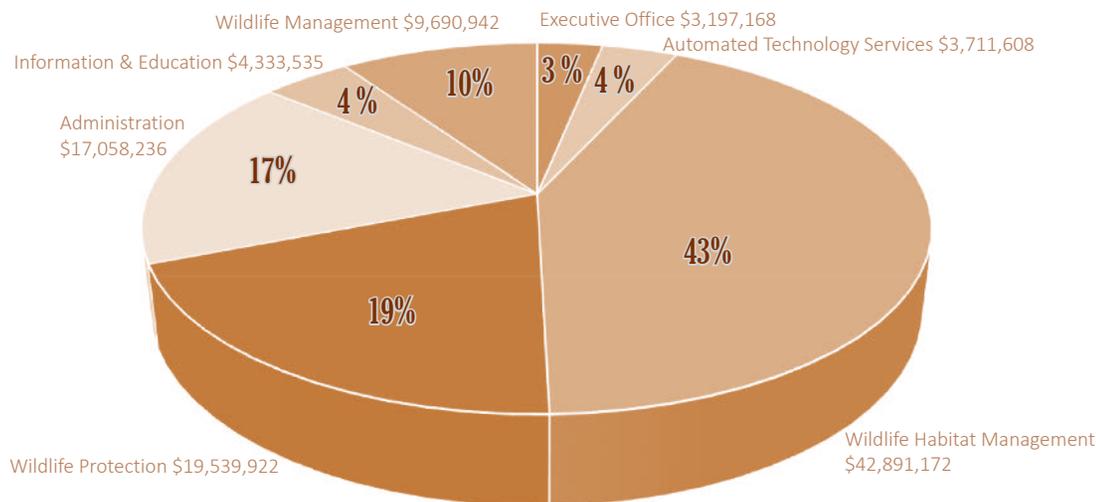


## Revenues and Expenditures



## Expenditures—\$100,422,583

Fiscal year ended June 30, 2018



Revenues for the fiscal year ended June 30, 2018 were \$117,147,608. This represents an increase of \$10,274,273 (9.6%) over the prior year's revenues of \$106,873,335. The majority of the increase can be attributed to ground rentals and royalties from oil and gas leases, which rose sharply, increasing \$8,232,403, or 41.6% from the prior year. The increase was market-driven, with an increase in demand resulting in new leases on game lands. Additionally, because gas royalties are tied to base price on volume and price increases, the increase in the overall price of natural gas likewise produced the rise in royalties. An additional \$1,074,335 was generated this year over last from the sale of adult pheasant hunting permits, which were introduced for the first time this year. Revenue from adult resident hunting licenses continued its downward trend this year, falling \$470,660 from the prior year's total. Adult nonresident hunting licenses saw a slight increase — \$42,560 over the prior year. Sales from the Federal Duck Stamp (eDuck), which allows residents and nonresidents to hunt migratory birds within Pennsylvania and any other state, increased this year to \$644,296, a 10.8% uptick from the prior year.

Total expenditures for the fiscal year ending June 30, 2018 were \$100,422,583. This represents an increase of \$3,909,835 (4.1%) over the prior year's expenditures of \$96,512,748. Because of the projected increase in revenue as described in the previous paragraphs, the previously-delayed replacement of high-maintenance equipment and high-mileage vehicles was able to occur this year. Purchases of equipment and machinery were \$1,392,098 higher this year than the last, while motor vehicles purchases increased by \$1,660,205.

# GAME FUND REVENUES and EXPENDITURES

Jacob Dingel

The Game Fund's Restricted Fund Balance was \$72,776,502 at the fiscal year end on June 30, 2018. This represents an increase of \$16,725,025, or 29.8 percent from the June 30, 2017 balance of \$56,051,477. The increase is attributable to revenues exceeding expenditures during the period by the same \$16,725,025.

## GAME FUND BALANCE SHEET

JUNE 30, 2018

### ASSETS

|                       |            |
|-----------------------|------------|
| Cash                  | \$67,922   |
| Temporary investments | 38,493,703 |
| Long-term investments | 40,357,292 |
| Accounts receivable   | 159,402    |
| Due from other funds  | 319,084    |

### TOTAL ASSETS

\$79,397,403

### LIABILITIES AND FUND BALANCE

#### Liabilities:

|  |           |
|--|-----------|
| Accounts payable and accrued liabilities | 4,331,574 |
| Securities lending obligations           | 308,643   |
| Due to other funds                       | 1,370,498 |
| Due to political subdivisions            | 4,687     |
| Due to other governments                 | 118,637   |
| Due to fiduciary funds                   | 486,862   |

### TOTAL LIABILITIES

6,620,901

#### Fund Balance:

|  |            |
|--|------------|
| Restricted Fund Balance-Environmental Protection | 72,776,502 |
|--|------------|

### TOTAL FUND BALANCE

72,776,502

### TOTAL LIABILITIES AND FUND BALANCE

\$79,397,403

## GAME FUND STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE

For the Fiscal Year Ended June 30, 2018

### REVENUES

|                                |              |
|--------------------------------|--------------|
| Licenses and fees              | \$45,212,175 |
| Intergovernmental              | 27,965,000   |
| Charges for sales and services | 41,552,150   |
| Investment income              | 2,340,461    |
| Other – donations              | 77,822       |

### TOTAL REVENUE

117,147,608

### EXPENDITURES:

|                                    |            |
|------------------------------------|------------|
| Recreation and cultural enrichment | 98,850,707 |
| Capital outlay 1,571,876           |            |

### TOTAL EXPENDITURES

100,422,583

### NET CHANGE IN FUND BALANCE

16,725,025

### FUND BALANCE JULY 1, 2017

56,051,477

### FUND BALANCE JUNE 30, 2018

\$72,776,502



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Annual Report



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