

FORESTRY FOR Wildlife

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PENNSYLVANIA GAME COMMISSION



FORESTRY FOR
Wildlife

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1.3 million of the 1.6 million acres of Pennsylvania State Game Lands are forested. The Pennsylvania Game Commission is unique in its practice of forest management, fulfilling its responsibility to care for these lands with an approach it calls “Forestry for Wildlife”.

Our state game lands grow some of the most valuable hardwoods in the world, and like many other organizations managing timber resources, we closely consider the role of revenue in our harvesting and management activities. But our foresters always have a compass pointing towards actions that provide the best possible wildlife habitat: sometimes that involves financial return on management activities; often, it does not.

Practicing Forestry for Wildlife means understanding how the natural world works and how active management can guide those processes to create and support conditions, plant communities, and structures that maintain, establish, and improve quality forested habitats benefiting a wide range of bird and mammal species.

At the heart of this effort is a group of over 60 dedicated professionals who continuously

improve and innovate the science and practice of forestry to do better for wildlife and to enhance the experience of hunters, trappers, and wildlife enthusiasts.

The project highlights you read here are a small snapshot of how a few of our foresters have interpreted and acted on their charge to practice Forestry for Wildlife and what their work looks like in action. They all involve different actions and objectives: improving unique habitats for non-game species, replacing degraded forests with healthy ones, optimizing timber harvest layouts to improve deer hunting opportunities, and more. What all the projects have in common is that they provide for the needs of wildlife above all else. Read on and join our community of passionate people who celebrate Forestry for Wildlife.

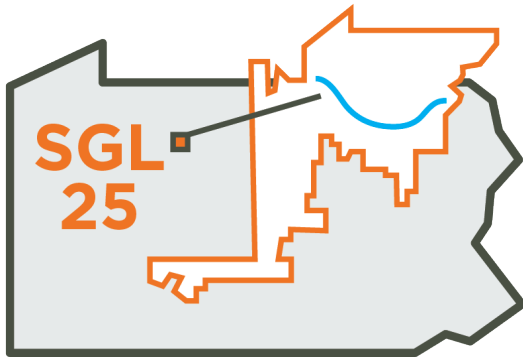
PRINCIPLES IN ACTION:

SUPPORTING NON-FOREST HABITAT

Moist-Soil Shrublands: Sparse Trees, Abundant Wildlife

“It’s fulfilling when you see these projects develop into excellent wildlife habitat.”

– Travis Weinzierl



One of the most difficult things for a forester to admit is there is too much forest.

But Pennsylvania Game Commission forester Travis Weinzierl knows that managing for wildlife habitat means thinking differently. He is one of several professionals charged with improving habitat on State Game Lands 25 in Elk County, the first game lands purchased by the PGC in 1920. It resides in the heart of

the “timber basket” of Pennsylvania, growing some of the most impressive and valuable hardwood stands in the world. Travis has learned landscapes dominated by “big timber” forest conditions lack the diversified habitats that support a larger array of wildlife. He notes, “This mature forest habitat is great in moderation, but to have entire game lands dominated by this extremely dark forest floor is not desirable.” He is confident that encouraging more non-forest habitat, even in an area known to produce significant revenue from timber production, is one important way to advance the agency’s mission.



View of the Crooked Creek Valley project area after the cutting prescription.

HUNTER'S CORNER

The 214 acres along the Crooked Creek provided the ideal opportunity to encourage a moist soil shrubland with an incredible diversity of wildflowers, grasses, shrubs, and trees. After many decades of the forest encroaching into this area, much of that diversity was lost. By removing some of the larger trees, more light could reach the shrubs and herbaceous plants that have been blinking out in the shade. Travis implemented a cutting prescription that felled 80-90% of the overstory trees in this bottomland but left the downed logs and tops on site to provide critical woody debris structure and limit soil disturbance that would otherwise be unavoidable in such places. He was also careful to protect small islands of hemlock, spruce, and mast-producing crabapples. The result is a meandering corridor - several



A bat box made at the Howard Nursery installed at the edge of the shrubland is important for housing colonies of female bats raising pups in the summer.

miles long - dominated by a mosaic of sumac, blackberry canes, goldenrod pockets, asters, grasses, and sedges. The flush of wildflowers is especially important to pollinators such as bees and butterflies, as well as a whole host of other insects. "You're looking at supporting the base of the food web in an open habitat like this," Travis says. "This potential food source can allow you to have a diverse wildlife population." These insects provide the necessary food for

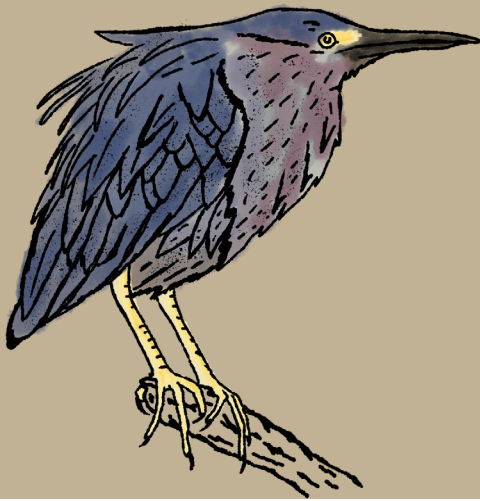
Beaver dam complexes offer refuge for all kinds of game species, including the beaver itself. Waterfowl like the wood duck can often be found floating on the ponds. Grouse and trophy bucks will hide in the swampy thickets. The key to success is finding your way into these hidden gems without alerting your quarry.



Beaver pond along Crooked Creek.

species like the endangered northern long-eared bat and the American woodcock.

Shrubs and wildflowers aren't the only plants to take advantage of this new light regime. Typical streamside trees like willow have begun to respond to this management strategy. Thickets of aspen trees have also quickly emerged. These regenerating hardwoods are expected to be actively managed by something else already increasing in these open stream bottom habitats - beavers. Beavers, widely recognized habitat manipulators in their own right, act to maintain the habitat in an open condition since they require a constant supply of fresh-cut stems to replenish their dams, improve their lodges, and serve as their primary food source. Trees like aspens and willows respond well to this constant harvesting and often grow back into dense thickets, which is also good for grouse and woodcocks.



FOCUS ON WILDLIFE NEIGHBORS:

Wildlife live in intertwined communities. A site with healthy and diverse habitats will draw in all kinds of wildlife. The beaver complexes in these moist shrublands invite everything from grouse and woodcocks to bats. Open waters increase insect activity, benefiting bats. Thick cover attracts the grouse and woodcocks. Fish in the dams draw in predatory birds like the little green heron. Wildlife are always in competition with each other for space and resources, but quality habitat lessens that competition by providing more of what they all need.

While beavers are fantastic managers of their surroundings and their work benefits innumerable wildlife species, sometimes they need help getting established in an area. Travis notes, "It took a lot of manual effort up front to create this habitat." That effort is a big part of a Game Commission forester's role in managing habitat. Often, the easiest way to ensure success in forestry operation to improve habitat is to mimic natural conditions and disturbances. By accelerating the cutting timeframe - a chainsaw cuts much quicker than a beaver's incisors - the site is set back to an earlier successional stage where fresh tree shoots flourish and North America's largest rodent can thrive.



Crabapples are an important food source for deer, skunks, racoons, foxes, and many songbirds.



Herbaceous ground flora is now abundant throughout the bottomland.

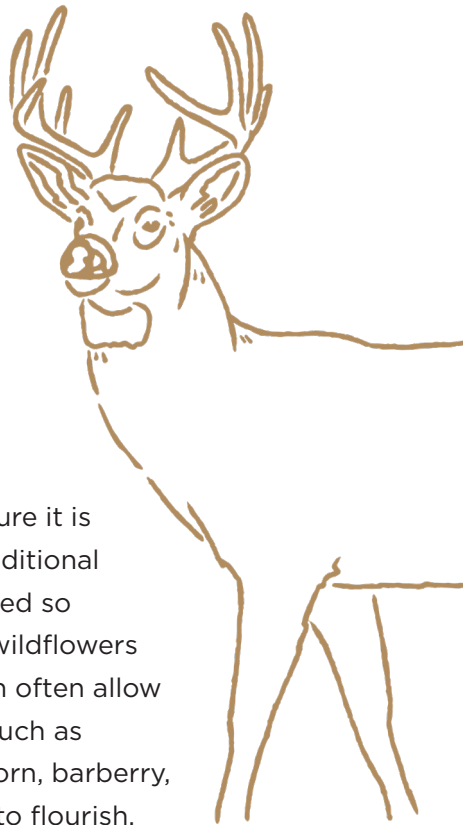
But there is far more in the works in the Crooked Creek project than beaver complexes. Tree and plant species that produce fruits and berries, or soft mast, were a big focus of this project as well. Elderberries and pokeberries left along the edge of an uncut area in the project provide easily accessible food for birds and mammals moving through the travel corridor created by the harvest. Blackberries and black raspberries will respond well to the shot of sunlight provided by removing many of the larger trees dominating the upper canopies.

As these berry bushes grow and expand, they will start to develop into thickets that provide cover for animals like the eastern cottontail and food for birds and bears. The beavers can

FORESTER'S CORNER

help these thickets remain productive longer by constantly cutting back the edge trees that threaten to overtop them and shade them out. Fruit trees like crabapple, service berry, and apple also received much-needed release in this harvest. “The additional light that was allowed to hit this crabapple allowed it to produce an immense amount of fruit that is extremely valuable to wildlife, Travis says. “Deer, turkeys, and grouse are all able to utilize this food source on this site.”

There will have to be routine follow-up on the project to make sure it is at its best. The additional sunlight that proved so beneficial to the wildflowers and fruit trees can often allow invasive species such as European buckthorn, barberry, and honeysuckle to flourish, but routine inspections for these invaders will be conducted for the foreseeable future. Cutting or selective spot herbicide application will be used to prevent them from getting established. “While in this current situation they aren’t a major problem, they can become a bigger issue,” Travis says. Invasive plants typically show aggressive growth and seeding capabilities that allow them to outcompete native plants. They usually don’t have any native insects, disease, or herbivory, which gives them an even further advantage. Sometimes the job of the forester isn’t just to promote and grow all the good things; it also includes holding back the negatives.



The Crooked Creek project is successful because it helps re-establish a natural process that maintains the bottomland conditions that would have happened naturally in those areas long before the age of modern conservation. The key to successful forestry projects depends on our understanding of underlying ecosystem processes and how they are responding to climate and human-induced changes.



Pockets of hemlock, crabapples, and aspen regeneration throughout the diverse Crooked Creek bottomland.

A close-up photograph of a beaver with dark, wet fur sitting on a log in a pond. The beaver is holding a large green leaf in its mouth and appears to be eating it. The background is a soft-focus view of the water and surrounding greenery.

**“We are dedicated to
make an impact on
the wildlife habitat the
Game Commission is
charged with managing.”**

**- Travis Weinzierl
FORESTER,
PENNSYLVANIA GAME COMMISSION**

Travis's work on the Crooked Creek moist shrublands project is emblematic of the Game Commission's commitment to Forestry for Wildlife concepts. The job was a big outlay of time and resources to produce a site that has almost no commercial value. But what it does provide is an incredibly valuable habitat for a whole community of wildlife. He takes a moment to look out across the project and summarizes it well: “We are dedicated to make an impact on the wildlife habitat the Game Commission is charged with managing.”

PRINCIPLES IN ACTION:

INVESTMENT PRODUCES COMPLEXITY

Breaking the Uniformity of Expansive Pole-sized Forests

“It is an incredibly good feeling to see that the habitat being created is now being used.”

– Caleb Hoffman



Imagine a place where you cannot find safety or food to live. You would likely not remain — you could not.

Large areas on State Game Lands 73 in Blair and Huntingdon counties used to be such a place for many of Pennsylvania’s wildlife species. But things are beginning to change on this landscape largely due to efforts of passionate land managers, biologists,

and foresters like Caleb Hoffman. Caleb describes the limiting situation on these game lands that resulted from a combination of factors over many years. “Prior land use, difficult access, and periodic spongy moth infestations have created a glut of pole-size hardwood trees in this mainly deciduous forested landscape,” he says. “Over half of these 20,000-acre game lands look like this.” He points to a forested stand consisting mainly of 6- to 8-inch-diameter birch, red maple, and black gum trees. While such stands have their place in the landscape, too much of them can result in poor habitat value because they offer little variation and lower opportunity in the way of food and cover for animals like white-tailed deer, ruffed grouse, and other forest bird species. Large, forested areas sharing this successional stage can become wildlife deserts.



Aerial view of canopy openings created by the Desert Storm habitat improvement project.



Caleb standing at the center of a group opening.

Enter Caleb's bold plan to do something about it through a large forest habitat improvement project on over 300 acres, the majority in an area along Sand Flat Road where the need for habitat diversification was greatest. Caleb's vision to improve the habitat condition was to use group openings to mimic the gap dynamics often found in older, late-successional forests. "Older forests in this region often have large openings in the forest canopy resulting from episodic wind and ice events that help to create a diversity of vertical structure in the forest and create opportunities for increased browse," he says. Caleb goes on to describe how his team planned and established over 30 group openings of various sizes ranging from 1 to 2 acres throughout the forest area in a careful design that used existing skid trails and created new ones that could be used as wildlife travel corridors.

The earnestness of Caleb's stewardship approach is partly reflected in his attention to detail in selecting the location of those gaps: cutting to encourage root resprouting by a patch of aspen here and a patch of sassafras there, or purposely protecting clumps of mast-producing cherry trees. But it also shows in his smile that emerges while looking at a large hickory tree. "We were careful to protect the few scattered large oaks, hickories, and black cherry trees by putting them on the edge of the openings, he says. "That way we have nuts and berries falling down into all of that thick stuff." Cover, mast, and browse are now all layered and interspersed throughout an area that had little before this intervention.

Two years after the harvest, most of the openings are indeed getting thick with an array of grasses, forbs, and tree seedlings. The most



FOCUS ON WILDLIFE NEIGHBORS:

Black gum trees are often overlooked for their tremendous wildlife value. Their fruits start to ripen in late summer and continue through October. They are an important food source to fall migratory birds, turkeys, squirrels, bears, grouse, and a host of other wildlife species. Additionally, black gums are known to produce some of the best honey in the world. The black gum is also one of the longest-living hardwood trees and prone to developing dens and cavities. This means a black gum can provide food and shelter for wildlife for centuries.

unanticipated response was an invasion by the Japanese angelica tree, a non-native shrub. Caleb reminds us that while this should be monitored for potential negative habitat effects, he is noticing that many other desirable native plants do seem to be growing up underneath their spiky canopies.

The future plan for this project area is to be able to return in 10- to 20-year intervals to ensure a continuance of this habitat condition. But it takes a special commitment to manage in this way. Caleb points out, “This type of harvest

pattern would likely not occur on private forest land where a clearcut would have likely been the obvious choice.” Clearcuts also have their place on the landscape, but Game Commission foresters are constantly pressing for more diversity within stands to benefit a wider array of wildlife species. It is critical to protect the few remaining old sentinel oaks with their wide-spreading canopies as well as the other trees harboring den holes that took decades to form.

The low value of the timber harvested in this project makes conducting management at



Older overstory trees like the white oak to the right of center make for quality leave trees on the edge of future openings.



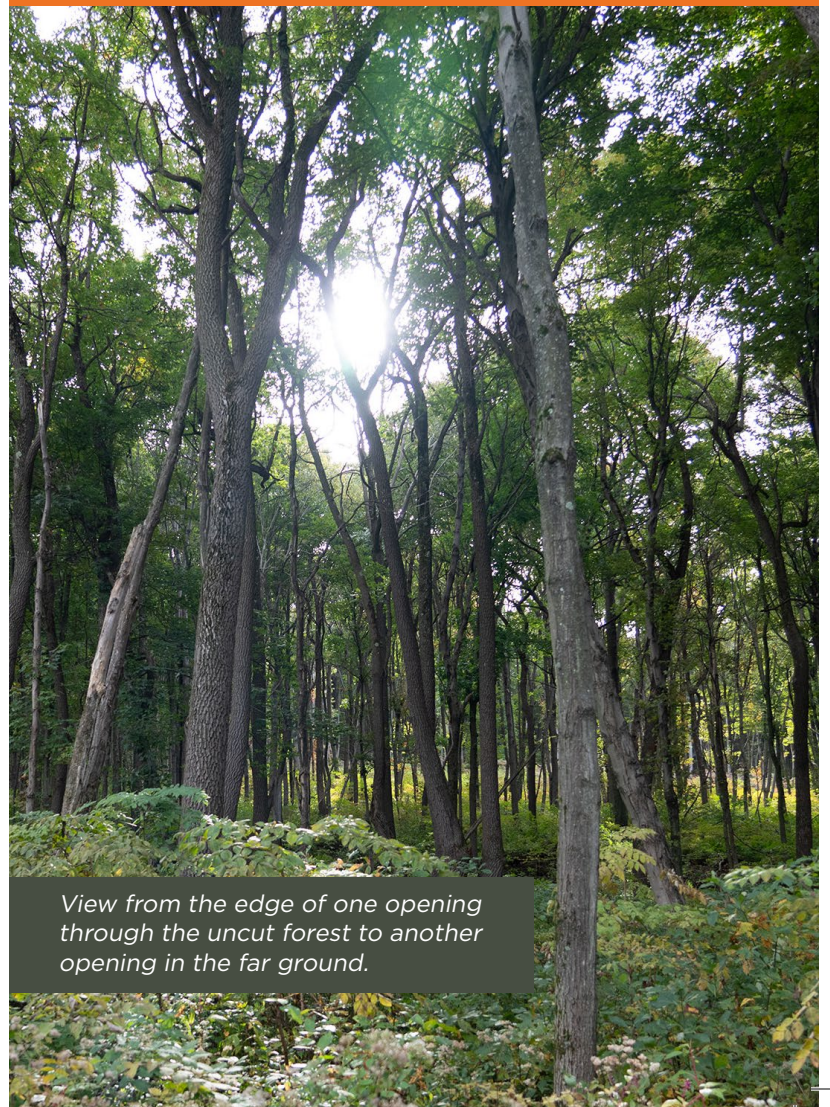
A den hole in a black gum tree with grape vines.

this stage of forest development a challenge. Furthermore, the recent loss of a local papermill market may have a greater future impact on the ability to sell these types of timber sales. But driven by mission and creativity, Caleb shows us other nearby projects currently in the planning stages that will aim to increase sale marketability by combining blocks containing more merchantable wood with blocks carrying less desirable material.


And if need be, Caleb has confidence the agency will support the investments needed to make sure the critical habitat improvements proceed forward. “It is all about the wildlife,” he says. “If we need to come back and lay down more sassafras poles to serve as grouse drumming logs, then we will do that. We are hoping that we get better tree regeneration in the openings, and we will do what is needed to help make that happen.” He points toward the ground at several yellow-poplar and cucumber-tree seedlings that were not part of the overstory before the harvest: evidence and hope that tree stocking and species composition can continue to be improved over time in his approach.

FORESTER'S CORNER

Updated inventories, management typing, and landscape analysis ensure efforts to increase timber sale marketability and avoid sacrificing the critical mature forests that many of our wildlife species need. A “Forestry for Wildlife” perspective is careful not to automatically consider a regeneration harvest in an area just because a cohort of favorable regeneration currently exists, or to automatically avoid considering disturbance in a pole stand that has not yet reached financial maturity. The highest wildlife value of a stand, set in a proper landscape perspective, sets the strategy; harvests therefore may be sometimes delayed, considered elsewhere, or hastened, depending on habitat need.



View from the edge of one opening through the uncut forest to another opening in the far ground.



“We are hoping that we get better tree regeneration in the openings, and we will do what is needed to help make that happen.”

- Caleb Hoffman
FORESTER,
PENNSYLVANIA GAME COMMISSION

Managing forests like these for the benefit for wildlife takes patience, an optimistic outlook, and a slight deviation from the traditional norms foresters usually hold. Caleb took us to one gap where he left a massive chestnut oak toward the middle. Unfortunately, it succumbed shortly after the harvest, perhaps a victim of several years of drought stress. Now it is a good woodpecker tree. Deer impact in some of the openings is certainly limiting the abundance and height of tree seedlings. But now, a heavily forested landscape is permeated by grass and herbaceous-filled openings with abundant edge habitat. Regardless, Caleb has met his objectives for now: these forests are alive again as a place a hunter would wisely consider finding deer, grouse, bear, and turkey.

PRINCIPLES IN ACTION:

INTERSPERSION

Thoughtfully Mixing Habitat Conditions Across a Landscape

“We’re not just so much looking at the acres of certain age classes, but also where they’re going to be located on the landscape. Just kind of looking for that patchwork quilt.”

– Curtis Noll



Curtis Noll fittingly stands atop a pile of waste coal as he describes the history of forest disturbance in the southeast region of Pennsylvania: rapid, where forests turn back to newly regenerated, young forests, on a shorter time scale than in many

other parts of the state, and importantly varied from place to place. “We’re just kind of mimicking what happened in the charcoal era,” Curtis says. “As rugged as the terrain is, we have a limited landscape in which to work, so if we can maintain certain areas on those south aspects with fire and just use even-aged silviculture on the rest of this tract, we can make sure we’re keeping this landscape, which is about 2,500 acres, with as big a



A typical shelterwood harvest on SGL211 is used to help establish quality young forest.

percentage as we can in forests younger than 20 years; that's kind of what we're going for." As we stand with him observing a timber harvest he has recently overseen, we are reminded that forests remain forests whenever they are harvested with the promise of regeneration: new, young forests are forests; old forests are forests; middle-aged forests are forests. But each offers something different to the wildlife and people in the landscape who visit them, and that diversity strengthens a mosaic in the overall landscape, what Curtis calls a "patchwork quilt."

Curtis says almost half the area of State Game Lands 211, in which we stand, is designated as "reserves," forests whose fate is to mature under active monitoring but where harvests are not scheduled. Some other areas involve careful introductions of prescribed fire to maintain specific habitat conditions. Others involve careful, intensive work to enhance specific habitat features for threatened species like



Carefully designed skid trails and frequent inspections of active timber sales are critical components in meeting quality young forest objectives.

HUNTER'S CORNER

You probably choose your favorite hunting or wildlife viewing "spots" because you know that the features you find in that spot – things like brushy vegetation or acorn-producing trees – are good for the species of interest. But thinking about how wildlife move between habitats in a varied landscape can help improve your choices.



Young trees marked for cutting to create openings and increase variability in forest structure.

the Allegheny woodrat. Elsewhere, Curtis balances the values and structures of forests characterized by different ages and species mixes, especially considering where opportunities to tinker with those forests present themselves in the mosaic of the larger landscape, which also means thinking about what happens on private lands adjacent to where he does his work.

If the harvest area in front of us is the newest patch in the quilt Curtis is describing, then here on the edge, we are standing on its stitches. Curtis points at other margins of the harvest, describing each neighboring patch: how old it is, what tree species it has, what it offers to wildlife, and how it connects to the young forest his harvest creates. "There's a stand that's around 8 years old to the south, and then we'll have this stand next to it, and this is where



FOCUS ON RUFFED GROUSE:

“Not that it’s all about grouse, but a lot of times, that’s kind of the bellwether we’re doing our management for. Obviously, we’re going to help a lot of other species too.” Lack of young forest habitat is a key factor that strongly limits grouse’s ability to thrive. We alleviate this limiting factor with management that diversifies forest age across the landscape, particularly when we create young forest, to the benefit of many species. “With the high stem density, we do see many woodcock coming through here, especially with some of the goldenrod on the landings and near the more well-developed, moist soils down in the riparian area. It has all of their habitat elements in one little area.



Trees with broccoli-like tops make highly functional reserve trees in this stand.

some of the wetland habitat is in between, so it’ll be pretty cool. You’ll have greenbrier thickets and different soft mast producers in there as well.” He notes one neighboring patch in particular, opposite where we stand, where the forest is “aging out” of the early-successional condition that he knows to be useful for many species, particularly ruffed grouse. “If everything continues to age, you’re going to lose the habitat. We were pretty close to losing grouse on this tract.” With the harvest he has designed and created in this patch where we are standing, grouse have a way and a place to stay in this landscape, a new young forest to inhabit. “There should be some good hunting opportunities, and opportunities for grouse to maintain their population as well.”

But Curtis’s vision for this patch is more nuanced than creating this new window of young forest conditions alone. “Sometimes our young forest stands are almost too homogenous, too.” He has chosen residual mature trees to stay behind after the harvest to create structural complexity in the new forest community and contribute food sources. His choice, for example, to retain a massive chinquapin oak with a large crown, seems counterintuitive to the typical forester concerned about too much shade inhibiting the growth of young trees, but through experience, Curtis knows how the forests in his system behave, that the regeneration near this tree will still develop even as he keeps a large crown promising many more acorns. In another group of residuals, we see several

different tree species of varying sizes clustered together whose branches create vertical ladders where many different bird species may roost and rest. “Should be some good den trees here too,” Curtis says, nodding toward a dead sassafras. As we speak, harvesting equipment rolls by this tree carefully, following Curtis’s instructions and design, removing smaller stems that would impede the growth of a new forest but avoiding harm to the trees Curtis has chosen to remain in this patch.

This harvest, beginning in a mature forest and carefully resetting the system to start a new, young forest, looks familiar to many foresters, but Curtis has more to show us. Next, we visit an area that was only about 35 years old, too young to be what many foresters consider “mature” in economic or reproductive terms, when Curtis boldly decided to cut it anyway, counting on the behavior of the hardwood species in the area to resprout vigorously. They did, and the harvest “reset” a new, young forest condition in an area of the landscape where grouse were losing it.

Regenerating a 35-year-old forest might be unconventional, but Curtis tells us that in his experience, the mix of vegetation after a cut like this is more diverse than when the stand was last regenerated in the 80s or 90s. He points out the varied layers of growth across the patch, some areas where fast-growing species have shot up and species pockets that are slower to develop. “Some sites, it’s hard to avoid a monoculture of birch or poplar, but we seem to have a more diverse seedbank than in different parts of the region. Instead of having two or three species at most in the regenerating stand, in this area, you’re probably talking 15 species at least in there.” Curtis credits this in part to working in land that is used to a history of rapid disturbance. Going forward, another harvest will be planned for this young stand after 40 years of growth.

FORESTER'S CORNER

Curtis's use of shorter rotations in his effort to maintain young forest habitat in his landscape uniquely succeeds due to a combination of factors he is able to recognize and leverage simultaneously: necessity (with a high degree of reserves in his management portfolio, he chooses to work more intensively with stands designated for even-aged management), ecological opportunity (rapidly growing species like yellow poplar shorten the window of time to potential commercial entry, and oaks tend to compete well on most sites), and market opportunity (reliable low-grade markets and established relationships with operators accustomed to pulp contracts allow flexibility). “We have roughly 3,000 acres that will be in 40-year rotation. That’s our moderate to better growing sites where we’re trying to do that.”



Commercial timber harvests are an essential component of the Game Commission's habitat improvement program.



30- to 40-year-old tulip poplar stands provide an opportunity to use short rotations to create more younger forest.

Nearby, in another forest approaching 40 years of age, we look up at (surprisingly to eyes used to the “typical” look of a 40-year-old Pennsylvania forest) large, fast-growing tulip poplars and down at scattered oak seedlings ready for an opportunity to grow. “On sites like this, you can grow sawtimber in 30-40 years.” Here, Curtis talks about a clear opportunity to release the oak, resprout the poplar, and open up yet another new patch of young forest habitat within a few years. Seizing opportunities for action in stands like this has become a typical mode for Curtis. “We kind of hit fast forward on some of our management plans. We’re much more quickly on some of these larger game lands getting to where we want our age class distribution to be in certain areas.”



Curtis’s work on State Game Lands 211 reminds us of how thoughtfully and creatively our foresters think not just about what happens in one place, but how each action ripples across a larger landscape, and how to reopen doors to habitat conditions that might, without urgent action, begin closing for key species like grouse.

A photograph of a grouse perched on a tree branch. The bird has brown and white mottled feathers and a small crest on its head. The background is a blurred forest scene with tree branches.

**“There should be
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**- Curtis Noll
FORESTER,
PENNSYLVANIA GAME COMMISSION**

Curtis summarizes his broad approach with the phrase “different tools for different sites” and speaks of learning and adjusting his approach along the long arc of the landscape he manages. “You can look back on what happened in the past before you were even born and put those pieces of the puzzle together: how things are going to react and how things are going to look down the line too.”

PRINCIPLES IN ACTION:
**PROTECTING
DIVERSITY**

Managing Unique Species to Benefit Unique Species

“In the wintertime, it’s pretty crazy in here. There are snowshoe hare tracks and fisher tracks all intermixed. It’s a wild place.”

– Evan Delp



Game Commission forester Evan Delp mentions the wildness of the place as he walks through the Drybite habitat project on State Game Lands 57. And if Evan is successful in

his strategy, this piece of game lands will get a little wilder every year. Over a century ago, large swaths of this part of Luzerne County were covered in forests dominated by

red spruce. Records show that millions of board feet of red spruce timber were harvested here at the turn of the last century. Now, Evan is working to promote and expand the remaining pockets of these stands to benefit some of Pennsylvania’s more unique wildlife species. Right now, most of the red spruce has been relegated to the wetlands and wet shrublands where it has more of a natural advantage over the encroaching hardwood species like beech, birch, and maple.



Red Spruce trees in the midstory after the liberation cut.

FORESTER'S CORNER

This 118-acre project is designed to expand multiple age classes of red spruce back into the surrounding hardwood forests. Several noteworthy wildlife species are known to inhabit these late successional coniferous forests – the yellow-bellied fly catcher, blackpoll warbler, northern flying squirrel, northern harrier, and snowshoe hare to name a few. The expansion of this forest type is especially critical for the state endangered northern flying squirrel. Lichens and fungi that grow in the spruce forests are important components of this gliding rodent's diet. So, Evan has identified areas with scattered, large red spruce trees in the overstory and pockets of smaller spruce seedlings and saplings being choked out by the beech brush. It's a lot easier to be successful when you have a little something to start with. His plan is to use a strategy called a "liberation cut" to release red spruce of all sizes from the competition of surrounding hardwood trees. But most of this area is too sensitive for operating logging equipment, so the Game Commission pays contractors to hand fell the trees that are marked. Evan notes "This was the first non-commercial cutting project on these game lands. One that was fairly obvious to us, because east and west of it are true, contiguous red spruce stands that you don't see any place else. They're upwards of 100 acres each. There's a degraded hardwoods stand that goes up through the middle with a mixture of red spruce and highbush blueberry."

Evan is working to develop late successional forest conditions in this project at an accelerated rate. This means that there will be large, mature red spruce trees growing in the same areas of pole-size and smaller spruce trees. The final look of these stands, when successful, will be layers of red spruce trees from 6 inches tall up to 100 feet tall on top of each other. During this management cycle,

In this project, Evan is managing towards "late-successional" forest characteristics. These forest types are toward the older end of the development spectrum but aren't "old growth". They are typified by larger diameter trees with multiple layers of younger trees growing under them as well as a high amount of downed woody material covering the ground. Red spruce are a long lived, shade tolerant species, making them perfect candidates for late-successional management.



Hardwood pole trees felled to help facilitate new cohorts of red spruce and to release existing saplings.



FOCUS ON THE NORTHERN FLYING SQUIRREL:


Not to be confused with its more widespread relative, the southern flying squirrel, the northern is listed as an endangered species in the state of Pennsylvania. Loss of the red spruce and hemlock dominated forests that the squirrel calls home is the leading cause of their decline.

pockets of small birch and beech will be completely cut, creating early successional habitat in the midst of the late successional conifer stands.

“In these open pockets, I would hope to get some *Rubus* (blackberry and black raspberry) starting to fill in,” Evan points out at one location. This level of forest complexity will provide cover and habitat for non-game species like the northern flying squirrel but will also benefit game species like the snowshoe hare and the ruffed grouse. Both species rely on higher stem densities with some good overhead cover to protect them from predators like hawks and owls.



Wow, those look like red spruce cones!



“This was the first non-commercial cutting project on these game lands. One that was fairly obvious to us, because east and west of it are true, contiguous red spruce stands that you don’t see any place else.”

**- Evan Delp
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PENNSYLVANIA GAME COMMISSION**

“There are also snowshoes here. There’s a lot of grouse. I flushed five the last time I was out here,” Evan casually mentions. The method of cutting for this management approach is also a big benefit to those species. The hand felling with no removal of trees creates a lot of large, woody debris on the ground. The larger trees on the ground become perfect drumming logs for male grouse. The smaller stems all dropped across each other creates a jackstraw effect that the hares can shoot between and take cover.

PRINCIPLES IN ACTION:
**INCREASING WILDLIFE
ENCOUNTERS**

Working Like a Forester, Thinking Like a Hunter

“Just always trying to create something different. Make different habitats. That’s something I like to see.”

– Brandon Karlheim



Brandon Karlheim, Southwest Assistant Regional Forester, walks through the project like an archery hunter looking for the perfect place to set his tree stand. As a matter of fact, that’s exactly what he

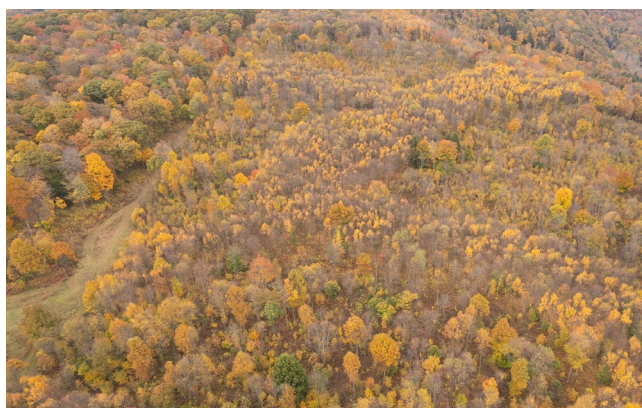
did when he laid out a recent forest habitat improvement project on State Game Lands 79 in Cambria County. “I

tell our guys all the time, look for tree stand trees,” Karlheim says as he stands in the intentionally designed travel corridors created by the project. He approached this project the same way he tries to for all his work on game lands, looking to improve conditions for the wildlife of Pennsylvania and the hunters who pursue them.



Bird's-eye view of corridor progression

SGL79 is over 10,000 acres and is dominated by mature oak forests. Brandon knows that a mix of habitat conditions all jumbled together in one area provides the biggest benefit to the greatest amount of wildlife. In this particular project, he was specifically focused on game species like white-tailed deer, grouse, turkeys, and black bears. He wanted to take a pole-sized stand with limited wildlife benefit and strategically reset parts of it to young forest. “I put my blocks to have one cut area on each corner, then tie them together with uncut travel corridors that go North, South, East, and West across the unit,” says Karlheim as he stands on one of the game trails that run right down the middle of the corridor. Just like he planned.



The cutting blocks and corridors in late fall.

What drove Brandon to lay out this project is one of the things that makes being a Pennsylvania Game Commission Forester so unique, the driving focus of making the best habitat possible. The stand started as a 30-year-old pole stand dominated by black birch. “Let’s look at this birch stand,” Brandon pondered back in 2017, “there’s nothing to do with it from a traditional forestry standpoint....so let’s put it on the ground and create some new habitat.” And that’s exactly what he did. A contractor was hired to cut all the black birch trees while reserving all the trees that are more valuable to wildlife like red oak, black cherry, service berry, beech, and hickories. The area regrew quickly

HUNTER’S CORNER

Edge habitat is heavily utilized by a wide range of wildlife. These areas often provide thick cover and reliable food sources right next to travel areas. Playing the wind right and setting up a deer stand along this habitat can let the deer come right to you as they move in and out of bedding areas and head out to feed.





FOCUS ON WHITE-TAILED DEER:

Deer are habitat generalists. This means they can take advantage of almost any habitat they happen to live in. That doesn't mean things can't be improved for them. A healthy habitat offering year-round food supplies and good cover means a healthy deer herd and better hunting opportunities. Habitat projects like this one that are designed to help hunters predict deer movement and thus increase their odds of harvesting a deer support the larger stewardship responsibility we have to properly balance deer populations for the benefit of all species.

with plants like blackberries, mountain holly, black cherry, poplar, red oak, and cucumber trees. All the cut trees were left on the ground as coarse woody debris and drumming logs for grouse. Now even the habitat in the uncut areas has been improved and is being utilized by wildlife and hunters. Brandon points out the ladder stand that has been set up by a hunter at the intersection of the uncut travel corridors. "That's exactly where I'd set up my stand," Brandon notes as he walks by. When asked "Do you think this would ever happen if this wasn't a Game Commission project?"



Brandon emphasizes that not every landowner would find it easy to pay a contractor to come in and just do cutdown work for them. “But that’s one of our main objectives. We create the habitat for the wildlife, which people eventually find and learn to hunt it.” Later he tried to drive that point home “What it means to be a Game Commission forester is realizing it’s not just traditional forestry. We’re here to create habitat. That’s what I look for in any future employees, the desire to create this type of habitat for wildlife.”



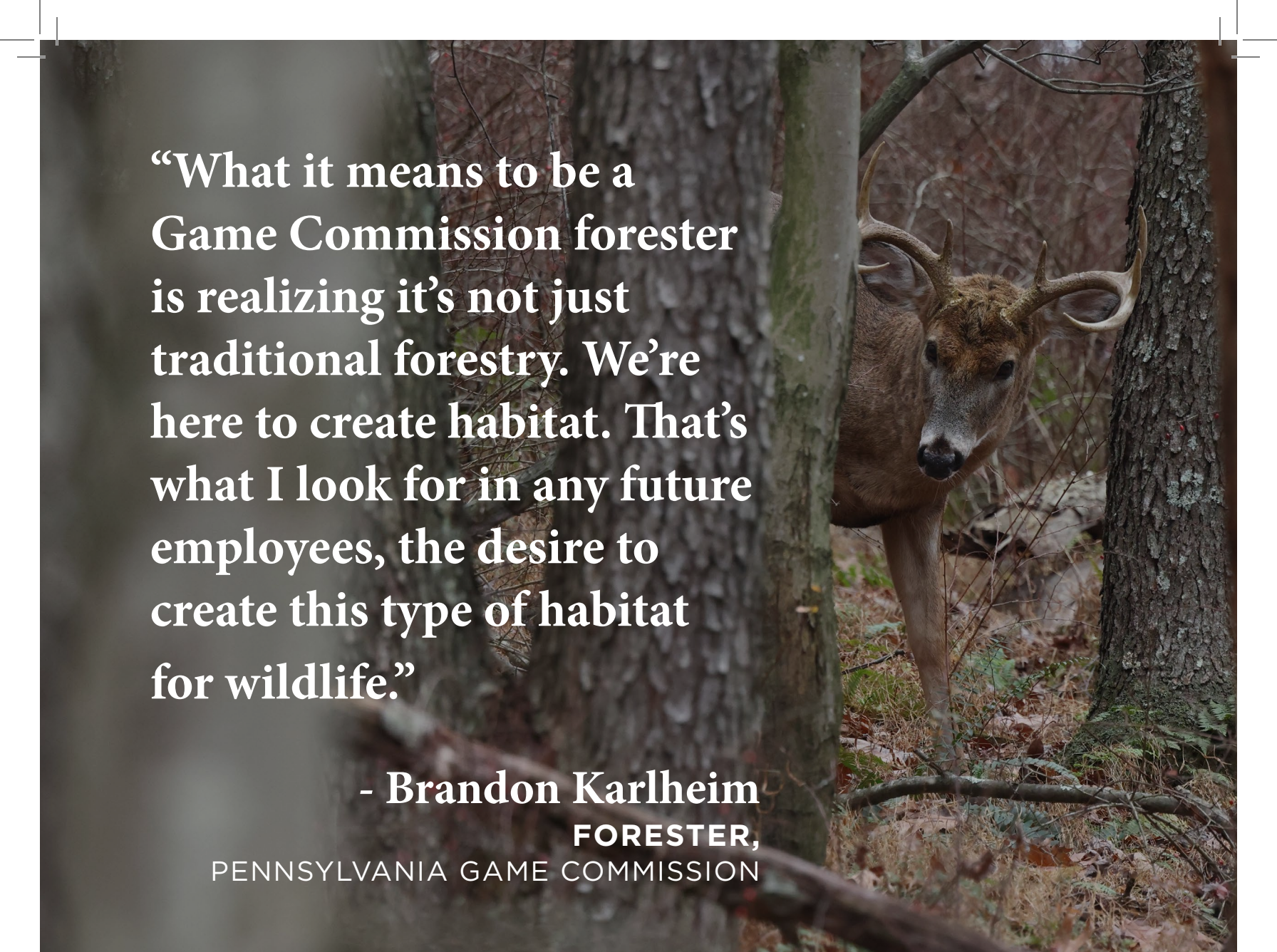
Foresters walk along a retired skid trail among the residual trees in one of the larger openings already containing abundant regrowth and wildlife response.

This project is intentionally laid out in close proximity to several other habitat projects on the immediate landscape. While standing in the middle of another project just down the grassy road from where the day started, Brandon points across a larger cut block and says, “That first project is essentially on the other side of those open woods. Less than a quarter mile and you’re back into those thick bedding areas.” The open woods he is pointing at are dominated by mature, large canopy oak trees — an important

FORESTER’S CORNER

Brandon intentionally used the uncut strips as travel corridors because of their attributes that benefit the movement of wildlife. It is important to take notice that our impact as foresters extends out beyond the project boundary. The characteristics of the “unmanaged” portion of this project changed along with the cut blocks. Side light, seed dispersal, and regeneration all improved along with the habitat benefits.





“What it means to be a Game Commission forester is realizing it’s not just traditional forestry. We’re here to create habitat. That’s what I look for in any future employees, the desire to create this type of habitat for wildlife.”

- **Brandon Karlheim**
FORESTER,
PENNSYLVANIA GAME COMMISSION

food source for wildlife to fatten up on as they head into the lean winter months. This project was a low-value pulpwood sale. Even though it didn’t bring in much in the way of dollars, the habitat is invaluable. “I wouldn’t be surprised to come in here and flush grouse, kick out a bear or a buck,” he says. “Whatever you’re looking for, you’ll find it all here.”

PRINCIPLES IN ACTION:

RESTORATION

From Extraction to Excellence

“My job is to manipulate habitat for wildlife. That’s where my heart and passion lie.”

– Dave Smerkar



State Game Lands 31, in Jefferson County, offers Northwest Regional field forester Dave Smerkar the opportunity to see where his passion for wildlife can take him. These game lands were heavily

strip-mined for coal in the 1950s and 60s. The way they cut along the contour lines and then reclaimed the site,

“basically turned the ground inside out,” Dave points out as everyone looks out across a landscape littered with high walls. Some of these areas were reclaimed with pine and spruce plantings, others grew back with early successional species like black birch, aspen, and black locust. Dave notes, “These poor soil sites aren’t going to grow high quality trees, but aspen does well and is pretty easy to regenerate.” He notes the importance of not ignoring places others might consider scarred.



Abundant aspen regeneration on the reclaimed mine land.

Rather, Dave sees the perfect opportunity to continue the journey of restoration that people before him started and that with a sustained effort can produce a quality young forest habitat.

“We’re focusing on grouse in this area because it’s a species of intense decline right now. But these kinds of young forests help all kinds of species,” Dave points out as he’s showing all the work that’s been done on over 500 acres of this retired mine land. Before any trees could be cut on this project, a lot of preparatory work had to be done to ensure the best chance for these sites to become magnets for wildlife. Most of the unmanaged areas have been impacted by invasive plants like autumn olive, multiflora rose, knotweed, and mile-a-minute weed. These fast-growing plants need to be dealt with or else they will choke out everything else once they get more sunlight. They must be treated prior to harvest to avoid killing any desirable native species that would respond after the cutting. Backpack spraying provided the precision needed to spray stumps and avoid breaking off the aspen stems. This considerable upfront investment was possible because of available funding provided by the agency’s Pittman-Robertson grant.

Once the interference was under control, Dave could get to work on the rest of the project. Aspen regenerates rapidly and extensively through root suckering, so it just needs to be cut to grow. Different blocks of varying shapes and sizes have been laid out and harvested to grow more aspen. “386 acres of aspen have been regenerated on these game lands since 2011, and another 151 acres are currently in the shelterwood stage,” Dave tells the group. The goal is to create a landscape with forests of varying age classes. This puts 10-year-old blocks next to 60-year-old blocks next to fresh

HUNTER'S CORNER

The Pittman-Robertson Wildlife Restoration Act, passed in 1937, provided the Game Commission with \$35 million in FY 2022 to implement wildlife restoration projects. It is an annual federal grant matching program where the agency receives up to 75% of funds for qualifying projects. Funds from this legislation come from an excise tax on firearms, ammunition, and archery equipment — much of which is from hunters.



A well-placed tree stand on the edge of the aspen sea.

FORESTER'S CORNER

Stands that have limitations for current management due to past histories can be difficult to manage because of their degraded conditions. Nonetheless, they can play an important role in interspersing of habitat conditions across the landscape. Creativity and more available funding for restoration in the coming years for opportunistic management become critical to move these stands toward restoring high-value habitat.



Reserve islands of oak and hickory (clump of trees on right) increase stand structure.


cuts. “Whatever works for wildlife is what we’re after,” he puts out there without the slightest hesitation. And it certainly works.

Reserve areas are set aside dominated by oaks and hickories that run right into freshly cut areas where you can see the golden rod, asters, and *Rubus* shrubs popping up. So now it’s a diverse area. “There are all kinds of forbs and soft mast in here creating a plethora of food and cover for wildlife.” This type of “habitat interspersing” is exactly what Dave was trying to achieve. The close availability of multiple levels of cover and a wide variety of food types will draw in everything from songbirds to grouse and rabbits to deer and turkeys. But the aspen won’t stay in this condition for long. Dave tells us, “It’s amazing how fast this aspen grows after a cut. Some of these are 8-9 feet tall in one growing season.” This means Dave has to keep moving projects around from one area to another on the old mine ground.



Dave Smerkar stands next to an aspen sapling that is almost 10 feet tall after just one growing season.

Some of these aspen cuts have enough merchantable material in them that they can be sold as part of an adjacent timber sale. Others are cut by the Game Commission’s own habitat crews, while other blocks are bid out to be cut by professional logging contractors at the PGC’s expense or using Pittman-Robertson funds.



“We’re focusing on grouse in this area because it’s a species of intense decline right now. But these kinds of young forests help all kinds of species.”

- Dave Smerkar
FORESTER,
PENNSYLVANIA GAME COMMISSION

“We’re breaking up the age classes better,” Dave points out before moving on to the next area. By cutting several blocks every few years, the plan is to keep every possible type of habitat condition within an easy travel distance for wildlife into perpetuity. The vigorous sprouting and growth of the aspen stands makes this possible. “All these stands were cut in the dormant season between mid-December to the last week of March,” Dave tells everyone. This allows the aspen to respond much more uniformly and rapidly. Cutting all the stems when they’re not growing and processing water and nutrients allows the stumps to patiently wait until spring and then grow like crazy when it warms up. This helps the young shoots get past the deer faster because they can’t keep up with all the growth.

MEET THE FORESTERS

Travis Weinzierl is the assistant regional forester in the Northcentral Region with the Pennsylvania Game Commission. He has been with the PGC for 15 years. “Growing up hunting and fishing with my father promoted a value of conservation in me,” says Travis. “Working in forestry with the Game Commission allows me to focus on promoting the wildlife I grew up enjoying. What I enjoy the most is knowing that I am having a positive impact on helping wildlife, through our sound habitat management and seeing the wildlife response to it.”



**TRAVIS
WEINZIERL**

Caleb Hoffman is a Pennsylvania Game Commission forester in Blair County. He has been with the agency for 10 years. “As a Pennsylvania hunter, I find value in the work the PGC does to manage the states wildlife and wanted to be a part of it,” says Caleb. “I like the diverse nature of the job, whether it’s participating in a controlled burn, conducting an herbicide treatment, or marking a timber sale.”



**CALEB
HOFFMAN**



**CURTIS
NOLL**

Curtis Noll is the current Public Lands Section chief, having previously worked as a forest technician then a forester in the Southeast Region of the Pennsylvania Game Commission. He began his career with the PGC as an intern in the summer of 2011. “Being exposed to the Pennsylvania Game Commission’s habitat management program as a forestry intern was very beneficial to me in determining my future career path while I was working toward my degree at Penn State,” says Curtis. “Most of my education up to that point focused on industrial forestry practices only. This course work offered only minimal regard for wildlife habitat value provided through these practices. After my internship, I was certain that pursuing forester and habitat management career paths with the PGC was my ultimate career path,” added Curtis. “During my time as a PGC forester, I enjoyed the opportunities that were offered to me for collaboration with other program areas found within the agency. These opportunities included working with agency wildlife biologists, land managers, habitat crews, and GIS specialists to cooperatively write and update CMPs for more than a dozen state game lands in the Southeast Region.”



**EVAN
DELP**

Evan Delp is a forester in the Northeast Region of the Pennsylvania Game Commission, located primarily in Sullivan and Bradford counties. He began his career as a summer intern with the PGC. After a short time as a forest technician, he moved up to forester, working across multiple regions during his time with the agency. “I grew up in a small town in Bradford County near a few of my favorite state game lands,” says Evan. “I learned to understand the outdoors through hunting on those game lands with my dad, brothers, and sister. Becoming a better outdoorsman to me has always meant better understanding how wildlife interact with their environments. That was a significant motivator for wanting to become a PGC forester, and I now get to practice that every day in forest habitat management planning on some of the game lands I grew up on. My favorite part of being a PGC forester is witnessing wildlife response to habitat management practices I worked to plan and see implemented. I often find myself thinking, ‘I can’t wait to hunt this spot.’”

Brandon Karlheim is currently an assistant regional forester with the Southwest Region of the Pennsylvania Game Commission. He has been working for the PGC since 2010 when he started as a member of the Cambria County food and cover crew. He also spent three summers as an intern with the Southwest Region prior to that. He became a forester for the Game Commission in 2011. He always dreamed about working for the Game Commission, sparked by the time spent hunting with his dad and uncle as a little kid. Brandon hopes that with every habitat project he is a part of someday there is a parent and a son or daughter or a group of best buddies out there hunting these areas, having a blast, and making memories that will last them a lifetime and passing this passion onto the next generation.



Dave Smerkar is currently an assistant regional forester with the Northwest Region of the Pennsylvania Game Commission. He has been working for the PGC forestry program for 22 years. He originally joined the PGC for the opportunity to work in the outdoors and manage wildlife habitat. He enjoys seeing the results of the work that the PGC does and the benefits it provides to Pennsylvania's wildlife.





OUR MISSION

Manage and protect wildlife and their habitats while promoting hunting and trapping for current and future generations.



Pennsylvania Game Commission forestry and habitat staff gather at the 2023 Forestry Division biennial meeting.



