



They Talk About
Dauerwald in Missouri

BY JAMES M. GULDIN AND HERMANN RODENKIRCHEN

Dauerwald is a forest management concept first developed in Germany more than a century ago that has been used in adapted form on the Pioneer Forest in Missouri since the 1950s. Two foresters discussed its history during a visit to Pioneer Forest in 2017.

A German silvicultural approach articulated in the early 1920s departed from the methods advocated by Bernhard Fernow, America's first professional forester. Whereas Fernow had called for a strictly regulated plantation forest, harvested in clearcuts and regenerated through planting of commercially valuable species, proponents of *Dauerwald*—literally, “continuous forest”—used single-tree selection to harvest a steady supply of high-value timber. By maintaining continuous forest cover, these innovators could rely on natural regeneration and achieve a more balanced ecosystem.

The *Dauerwald* concept was introduced to the United States via the *Journal of Forestry*, and Aldo Leopold was among the American forest researchers who traveled to Germany to see it in practice. Today the approach underlies the “close-to-nature” forestry of the *Arbeitsgemeinschaft Naturgemäße Waldwirtschaft* (ANW) (Working Group for Natural Forest Management), a German association of forest owners, foresters, and scientists.

It is also closely related to the uneven-aged silvicultural method used on the Pioneer Forest in the Ozark Mountains of southeastern Missouri. This forest comprises tracts totaling 144,000 acres, acquired in the early 1950s by Leo A. Drey, a Missouri forester and conservationist.

The largest acquisition was 90,000 acres, bought from National Distillers Products Corporation in 1954. In 2004, Drey and his wife, Kay, donated those holdings, which they called Pioneer Forest, to their L-A-D Foundation, which is maintaining his commitment to conservation. (At the time of the donation, Foundation president Susan Flader wrote about the Dreys and the Pioneer Forest in “Missouri’s Pioneer in Sustainable Forestry,” *Forest History Today*, available at foresthistory.org/Pioneer-Forest.)

On the Pioneer Forest, the mixed-species, multi-aged oak-hickory and oak-pine stands are managed for high-quality white oak (*Quercus alba*), which yields veneer logs for cabinetmaking and stave logs for cooperage barrels used in aging wine and spirits. Proceeds from harvests fund the forestry and ecological management programs as well as rehabilitation of historic structures, wetland restoration, conservation land acquisition, scholarships, and community improvement projects.

Pioneer Forest managers select individual trees for harvest, avoid making gaps in the canopy, leave slash to decompose, and allow the forest to regenerate naturally. Examining a stand, foresters ask, Which trees are the crop trees, and which of their competitors are of poor form or quality, of a less desirable species, showing signs of poor growth, and large enough to be harvested? Thanks to a continuous forest inventory, they know how the overall forest is growing, and how a tree of a given species and size will grow in diameter and volume by the next cutting cycle harvest. This management closely resembles the *Dauerwald* approach in concept and practice.

Dauerwald forestry has seen fresh interest in Europe because of climate change. Although it cannot guarantee stability of an ecosystem that experiences intense windstorms, droughts, and nonnative insect and disease infestations, it promotes well-tended, healthy, uneven-aged and mixed-species stands with abundant natural regeneration, balanced deer populations, and fertile soils; the continuous forest cover even moderates the local forest climate. Such attributes promote resilience. Similarly, in the Missouri Ozarks, where wind and ice storms break branches and bring down trees, the several age classes in the mid-story and understory of Pioneer Forest stands provide some insurance against the loss of overstory trees to extreme weather.

In 2017, Dr. Jim Guldin, an expert in the theory and practice of uneven-aged silviculture and continuous cover forestry in the United States, and Dr. Hermann Rodenkirchen, an expert in the practice of close-to-nature forestry with the *Arbeitsgemeinschaft Naturgemäße Waldwirtschaft* (ANW) of Germany, spent a hot afternoon in August 2017 touring stands in the Pioneer Forest and compared notes on close-to-nature, continuous-cover approaches. They began by sharing their knowledge about the development of *Dauerwald* and its influence in North America. Their full conversation, with more particulars about its techniques and economics, is available at: www.foresthistory.org/Dauerwald-conversation.

COMPETING IDEAS IN EARLY FORESTRY

James M. Guldin: The earliest forestry experts in the United States were products of a European forestry education. Bernhard Fernow, a Prussian who studied at the Royal Prussian Academy of Forestry, emigrated to the United States in 1876 and became head of the Division of Forestry in the U.S. Department of

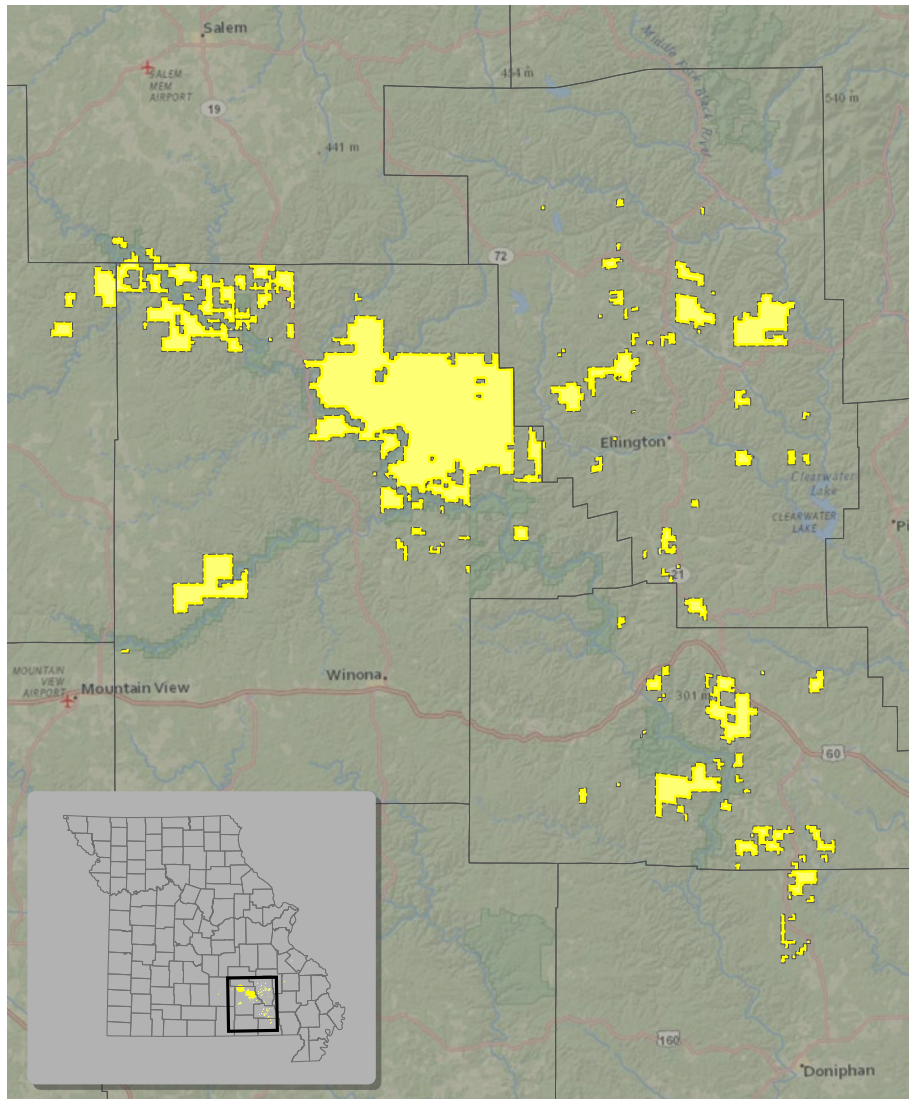
A managed oak-hickory stand supports several distinct size classes of oaks on the Pioneer Forest in Missouri. Photograph taken in 2017.

Agriculture in 1886. Gifford Pinchot, who in 1898 succeeded Fernow and in 1905 became the first chief of the U.S. Forest Service (the Division of Forestry’s more effective heir), had spent a year at the French National School of Forestry in Nancy.¹

However, taking the concepts of European forestry and using them in practical application in forests of the United States was the work of Carl Alwin Schenck.² Born and educated in Germany, Schenck arrived in America in 1895 to manage the 125,000-acre forest on George W. Vanderbilt’s Biltmore Estate near Asheville, North Carolina. In 1898, Schenck started the Biltmore Forest School, America’s first forestry school, to train men to assist him in the woods. Many of the school’s more than three hundred graduates became influential leaders in both government and industrial forestry.

Hermann Rodenkirchen:

We know Schenck discussed the fundamentals of both German and Swiss silviculture, including group and single-tree selection, in his book *Biltmore Lectures on Silviculture*.³ And Schenck conducted field tours of German, Swiss, and French forests for his American students to show them different examples of sustainable forest management. Schenck disliked German approaches to clearcutting, and other forms of harvest cutting that sacrificed future harvest potential for immediate gain. Instead, he advocated sustained production of large high-value sawtimber (what he and others called “conservative lumbering”) and appreciated very much the regulated selection system used in Switzerland, characterized by the periodic “control method,” which was developed and practiced since 1889 by Henry Biolley.⁴ Interestingly, Schenck later corresponded in 1950 with Karl Dannecker, the first president of the *Arbeitsgemeinschaft NaturgemäÙe Waldwirtschaft* (ANW) and a proponent of single-tree selection.



REBECCA LANDEWE, L-A-D FOUNDATION

Leo and Kay Drey donated Pioneer Forest to their L-A-D Foundation in 2004.

JG: In 1898, Fernow became dean of the New York State College of Forestry at Cornell University, where he built a curriculum based on German forestry practices.⁵

HR: As you know, Fernow was no friend of uneven-aged forest management. He was a strict advocate of the scientifically based German age-class forestry, which was developed in the early nineteenth century.

JG: And that got him in trouble! In 1903 Fernow was fired—for clearcutting the Cornell school forest to put in white pine. He finished his career as the dean of the Faculty of Forestry at the University of Toronto.

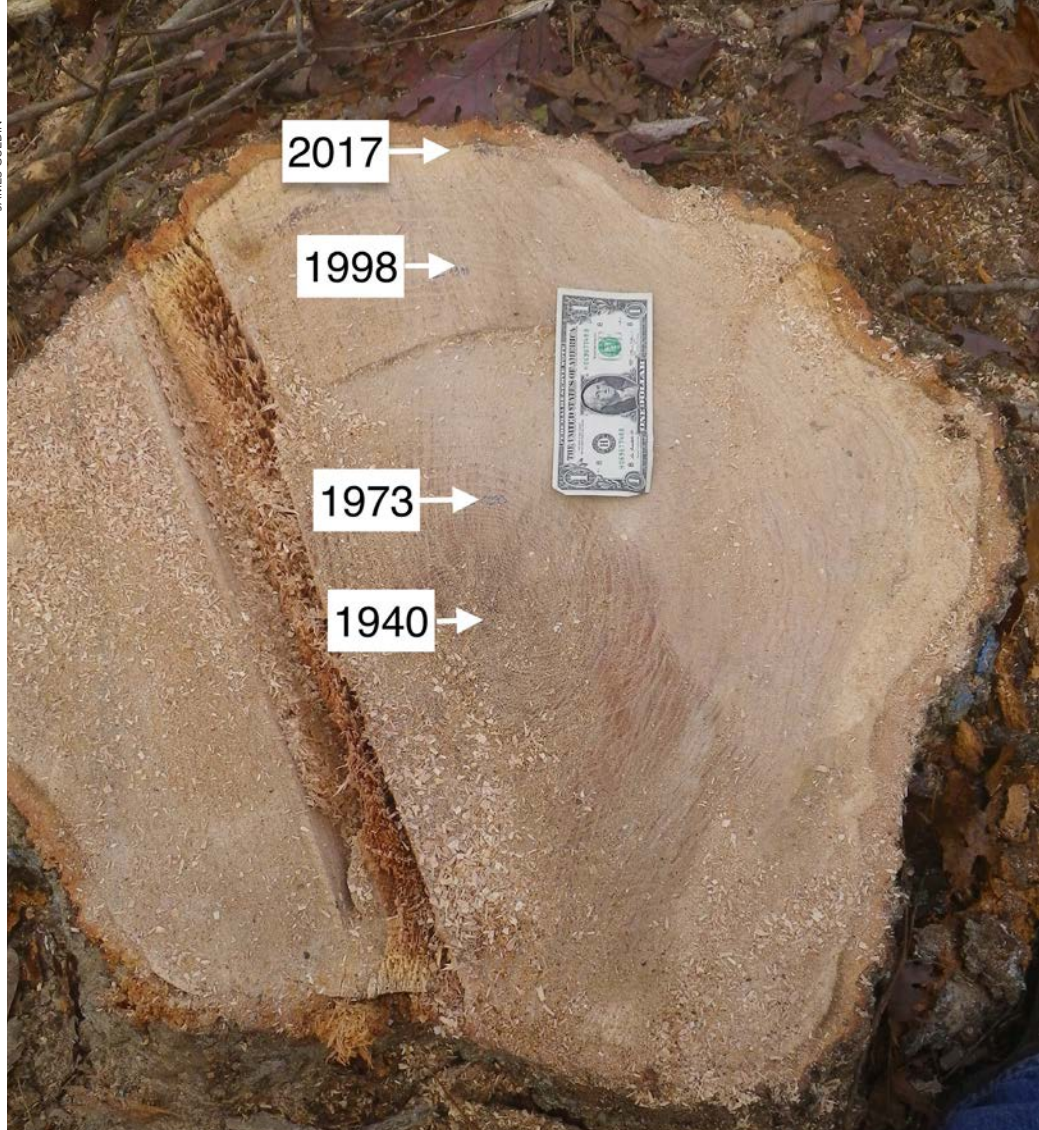
However, Fernow’s book, *A Brief History of Forestry in Europe, the United States, and Other Countries*,⁶ provided American foresters and forestry students with a detailed report on the evolution and current practice of forestry around the world. A third of the book is devoted to the evolution of forestry in Germany.

He reports that in the fifteenth century, harvesting in forests in the region was generally unregulated; in 1488, a low diameter limit of twelve inches was recommended, with restriction of pasturage in regenerating areas.

HR: At that early time, mixed-species deciduous forests in Germany were frequently harvested using the coppice-with-standards method; coniferous forests, however, were harvested by rough selective fellings. Farmers owning mountainous mixed forests with fir, beech, and spruce used “plentering” (removal of scattered big trees) for centuries, without any method to regulate harvests. By and large, it worked—and a few are still doing it! It’s no surprise that farmers often keep their own traditions or their old ways of doing things. But the traditional, unregulated selective plentering harvests were severely criticized by early forestry scientists and state forest administrations, and sometimes also prohibited by law, because landowners using plentering harvests often paid little attention to regrowth. That explains the expression “plentering is plundering.”

JG: In his book, Fernow noted that early German efforts at the selection method failed because of an inability to obtain regeneration, especially in oaks and pines; the approach had better luck in the more shade-tolerant spruces and firs. He reported on early attempts at even-aged regulation in Germany in the 1700s, with the pendulum swinging from selective cutting to thinning and clear-felling. He then introduced us to two fathers of German forestry, Georg Hartig and Heinrich Cotta. Fernow’s *Brief History* described how, in 1808, Hartig published eight “general rules” of natural regeneration in beech forests that set forth principles of the shelterwood method in fairly good detail. But Fernow complained that much “mischief and misconception” resulted from their generalization in other forest types.

HR: Hartig and Cotta also advocated plantation forestry with spruce or pine monocultures on degraded lands. They developed a sophisticated German clearcutting system that used fixed rotation ages



Growth rings on the stump of a black oak. This tree responded to cutting cycle harvest in 1973, then grew about twelve inches in diameter over the next twenty-five years. Between the 1998 and 2017 cutting-cycle harvests, diameter growth slowed to about six inches in nineteen years, so the tree was cut in 2017. The declining growth rate of black oaks in this diameter class is evident in the Pioneer Forest’s database, which guides foresters in marking these stands.

(similar to agriculture), leading to very artificial forest landscapes with large, geometrically configured blocks of pure coniferous plantations.

JG: Fernow reported that a reaction to those dogmatic rules came from Karl Gayer, professor of silviculture at Munich, and led to a reawakening of interest in natural mixtures and in group fellings associated with the selection method or *Femelschlag* (“expanding-gap” silviculture, which promotes regeneration in openings while maintaining a multi-age stand).⁷

HR: As far as I know, there was also a revolt by some landowners, not necessarily the foresters, against the problems of the clearcut system and plantation forestry. Plantations were frequently affected by insect attacks, windthrow, soil degradation, and decline in growth. This resulted in the loss of both wood volume and value, and an interruption in cash flow for landowners. It also raised costs for replanting, which was often difficult or unsuccessful because of frost, grazing, and aggressive grasses. Landowners expected a steady flow of profit from

the forest, which required stands to have good stocking and vigorous trees across all age classes in the stands being managed. These needs were met more effectively with uneven-aged, mixed-species systems.

The main worry for landowners was that a major disturbance would ruin their forests. They saw the solution in a management philosophy that promoted stable and resilient, “close-to-nature” systems with trees of all sizes. Relying on natural regeneration rather than planting was an advantage because it did not require a large financial investment. In short, the goal was to maintain cash flow for the landowner by saving money, and by producing a regular income from a steady supply of high-value timber.

DAUERWALD, DEFINED

JG: The *Dauerwaldwirtschaft* (continuous forest management) papers were published by Alfred Möller in the early 1920s.⁸ In all likelihood, foresters in the United States learned of it from a review by Ralph Hawley in the *Journal of Forestry* in 1922. Hawley was a longtime professor of silviculture at Yale University.⁹

Hawley defined *Dauerwald* as “management which maintains continuous forest.” He reported that Möller characterized the methods of management generally used in the region as either *Dauerwald* methods or clearcutting methods; the shelterwood methods were included in Möller’s definition of *Dauerwald*.

HR: *Dauerwald* is a general term. It isn’t related to a specific current forest structure or a regeneration method, but depends on the intent of the forestland owner to maintain a continuous forest. Stand age and rotation period do not play a role. The emphasis is put on the continuous selection system—tending and harvesting of stands, which automatically leads to the development



White oak stave logs produced during a cutting-cycle harvest on the Pioneer Forest, near Eminence, Missouri. They were likely turned into cooperage barrels used in aging wine and spirits.

of a desirable vertical forest structure, or a small group or mosaic structure in case of intolerant tree species (or low site quality). Tending, harvesting, and regeneration take place on the same area and at the same time. Foresters using the *Dauerwald* method must be flexible to adapt the marking method to local stand and site conditions.

The *Plenter* forest is a specific type of *Dauerwald* that depends on a balanced stand structure created by strict single-tree selection; it is restricted to forest types dominated by very shade-tolerant European silver fir (*Abies alba*), Norway spruce (*Picea abies*), or sometimes also European beech (*Fagus sylvatica*).

Möller accepted a wide range of structural possibilities about what could be *Dauerwald*, but he emphasized one fundamental

characteristic: *Stetigkeit des gesunden Waldwesens* (literally, continuity of healthy forests). This means managing the forest to maintain and utilize a healthy and self-regulating ecosystem with nearly balanced, interrelated components: biologically active and productive soil, diverse fauna and flora, and an uneven-aged mixed forest with enough standing volume for permanent high-value timber production. These elements are impossible to achieve concurrently in clearcut forestry. Of course, the word “ecosystem” was still unknown in Möller’s time; he spoke of “organism,” or *Waldwesen*.

JG: The British silviculturist R. S. Troup covered Möller’s work in his 1928 textbook,¹⁰ but I doubt that the book was widely available in the United States at that time.

HR: Troup was not really convinced of the general merits of Möller's *Dauerwald* concept.¹¹ He feared that unfavorable conditions (large areas, no intensive supervision, less successful regeneration) could cause a chaotic breakdown of forest management. Nevertheless, he accepted the fact that this approach could work well.

JG: Troup wrote that Möller applied the *Dauerwald* term generally to any system not involving clearcutting and exposure of the mineral soil, and would be comfortable including shelterwood methods. But Troup reported that Alfred Dengler proposed a more detailed grouping that considered *Dauerwald* ideally as the selection system, separated from the *Femelschlag* systems, the shelterwood systems, and clear-felling.

HR: Dengler was an opponent of Möller's *Dauerwald*. It's ironic because he succeeded Möller at Eberswalde University. But Dengler's proposed grouping fits rather well with the *Dauerwald* definition of ANW in Germany.

JG: Hawley and Troup both described the details of the development of the method. Möller's 1920 paper recounted the management of a Scots pine (*P. sylvestris*) forest over the previous twenty-nine years in the town of Bärenthoren, near Dessau in the German state of Anhalt (today, Saxonia-Anhalt). Troup wrote that the sixteen-hundred-acre estate belonged to Friedrich von Kalitsch, a nobleman who was also a trained forester.

HR: Kalitsch was an academically educated forester, landowner, and practitioner, not a forest scientist. He had no money and could not afford planting his forests, so he tried natural regeneration instead. This was a turn away from common practice at the time.

JG: This question of not having much money to invest turns up in

the American experience with the selection method as well. Hawley describes four general attributes of the *Dauerwald*: (1) maintaining forest cover, including uninterrupted tending of the soil and the stand; (2) using natural regeneration; (3) felling selected individual trees annually (the tree rather than the stand is the unit of management); and (4) securing the highest possible growth percentage on the biggest and most valuable growing stock.

HR: A characteristic of the *Plenter* principle, applied in *Dauerwald*, is to examine every tree and judge it on its own merits.¹² Even if it has a visible defect, the tree is not necessarily expendable (*entbehrlich*): it may have other functions to contribute to the local ecosystem that are important to retain, such as a benefit to species diversity, to soils, to mast production, or to wildlife.

JG: Troup summarized the ecology of the Kalitsch estate nicely. The forests in which *Dauerwald* was first implemented were forty-year-old Scots pine (*Pinus sylvestris*) plantations, with natural regeneration of pine occurring abundantly. Terrain was generally level, and the elevation of the area was about 420 feet. Soils were sandy, and the climate was generally dry. The region receives only about twenty-two inches of precipitation a year because of the influence of the Harz Mountains to the west.

In his 1922 review, Hawley noted several important features of *Dauerwald* as practiced at Bärenthoren, based on Möller's descriptions:

- There is an absence of clearcuts. Möller says that clearcutting makes the harvested part of the stand unproductive for timber production.
- The entire area of the forest is gone over annually and carefully thinned, including overstocked

pockets of regeneration. The goal is to have the crown occupy one-third of the height of the tree.

- Branches and thinnings in young stands are left on the ground, to build up the litter. In fact, removal of the litter, which prior to 1884 had been a common practice (to favor agriculture), is prohibited.
- In older stands, pine reproduction is desired and even encouraged.
- There is no fixed rotation age. Rather, each tree is held as long as possible, since the greatest growth percentage in timber comes from the biggest trees.

Hawley attributed the success of the method to the interest and technical ability of the landowner, von Kalitsch.

HR: Several of these observations require a comment.

There was a lot of litter raking in those times, which was very bad for soil health. Part of the increase in pine growth and regeneration, Möller reported, may have been because litter raking was suspended, causing some recovery of soil health but not creating dense, competitive ground vegetation, only a moss layer.

In *Dauerwald*, regeneration is never promoted by complete overstory removal. Some canopy is always retained. Regeneration comes in naturally after regular thinning. And gaps are not cut in the forest just to make gaps. But if a small or large pocket of regeneration can benefit, mainly in the case of light-demanding, shade-intolerant species, a gap can be created; we call this *Gruppenplenterung*—a kind of group selection. However, immature trees of the upper or intermediate layer that could grow into high-value trees are never sacrificed for regeneration. Regeneration is not allowed to drive the system.

One fundamental requirement for natural regeneration in German forests, including *Dauerwald*, is to

regulate the deer population. Most German forests do not have natural predators of deer, so hunting deer is extremely important. But the goal of hunting is not to bring home a trophy; it is to regulate the number of deer so that regeneration can become established and develop properly as an element of a functional forest.

Also, the tree species must be site adapted and produce natural regeneration. If a tree species is not adapted to the local site conditions or cannot regenerate naturally, it will not be useful. Tree species that work well in *Dauerwald* should be competitive, grow well in volume and value, not degrade the soil, and be resistant to stressors such as windthrow, pathogens, and bark beetles. For example, in Europe, nonnative Douglas-fir (*Pseudotsuga menziesii*) can be managed using the *Dauerwald* approach on a wide range of acid soils. But eastern white pine (*Pinus strobus*) is not a good species for the method in Europe because it is highly susceptible to mortality from blister rust.

In the *Dauerwald* method, we know that the value of a log, depending on its quality and volume, shows a logistic growth with time and as diameter increases. The optimum diameter for harvesting a crop tree is the point just before its value reaches a maximum, before the current growth in value starts to decline. If a large tree develops rot or discoloration, it will lose value even though it may still be increasing in diameter.

JG: In the 1922 review paper, Hawley goes on to describe some of the debate that Möller's 1920 paper inspired. Many of the comments centered on soils, regeneration, and the frequency of thinning. One expert pointed out the contradiction between the heavy litter layer promoted by the method and the exposure of mineral soil needed to obtain pine regeneration. Another critic suggested that a key to the method was maintaining soil fertility.

HR: Soil fertility, mainly nitrogen availability, was certainly improved in Bärenthoren by not raking litter or removing slash. But a soil scientist, Walter Wittich, pointed out that natural pine regeneration was restricted to specific soil and site conditions whether the *Dauerwald* approach was being used or not. Möller said that it worked only when soils were in good condition. And Wittich forgot to mention that traditional foresters, using clearcuts and large single-species pine plantings, never considered obvious site differences and soil fertility. Of course, today we have detailed maps that show soil and site conditions and inform us about the potential for natural regeneration of pine versus hardwoods. Such maps were unknown in Möller's time, and Kalitsch's decision to rely on natural regeneration was an innovative, courageous approach.

JG: Another expert suggested that the *Dauerwald* stands were not necessarily mature enough to regenerate. Some foresters had concerns that logging activity might affect regeneration. One suggested that *Dauerwald* principles were common both to the selection method and to modifications of the shelterwood method verging on selection, views that Möller probably held. Several argued that a three- to five-year cutting cycle was more practical than annual harvests, with which Möller agreed.

HR: Möller claimed that he thinned the total forest area every year. Of course, this is completely impractical. Today the challenge of marking large areas and conducting operational harvests is even more difficult because foresters are responsible for larger forest districts than in former times. Nevertheless, ANW is convinced that regular marking with short cutting cycles is an extremely important task for adaptive *Dauerwald* management.

JG: Here in the United States, we think that the length of the cutting cycle depends upon the productivity of a site. High site quality promotes higher growth rates, which means shorter cutting cycles; poor site quality results in slower growth rates, which will require longer cutting cycles. But the method can work in either event.

HR: I agree generally, but *Dauerwald* practitioners in Europe prefer shorter cutting cycles (ranging from three to eight years, up to twelve years in the Alps) than American foresters. From our experience, short cutting cycles are advantageous on very productive sites, in stands with restricted stability (during the transformation of overstocked plantations to the *Dauerwald* method), and in forests with very shade-intolerant tree species (so that competitors can be thinned before they die from overcrowding). And I should remind you that the family *Plenter* forests managed by farmers over the centuries worked quite well without fixed cutting cycles—the *Plenter* forest is highly resilient!

DAUERWALD GAINS, LOSES, AND THEN REGAINS FAVOR

JG: In 1935, American forester and wildlife biologist Aldo Leopold and five other foresters from the research and management sections of the U.S. Forest Service spent three months in Germany studying forestry methods. Leopold found German forests to be very artificial in species composition and structure—they were even-aged monocultures of spruce or pine instead of close-to-nature mixed forests—and overpopulated with deer but lacking large predators. He summarized his German experience in two papers published in the *Journal of Forestry*, entitled "Deer and *Dauerwald* in Germany." He reported that Germany presented a plain case of mutual interference between



Aldo Leopold toured German forests with other American foresters in 1935. He praised *Dauerwald* because of how it balanced the ecological needs of flora and fauna. Leopold is believed to be second from right.

game and forestry and suggested that Germans had concluded that “production of wood at the expense of soil health, landscape beauty, and wildlife is poor economics as well as poor public policy.”¹³

Leopold praised *Dauerwald* as an elegant compromise between better timber production in the long run and other benefits in ecological health. He also spoke to the very interesting proposition that better silviculture is possible only with better game management, and at the same time, better game management is possible only with better silviculture. Finally, he offered recommendations to American foresters: that a generous proportion of each forest should support floral and faunal conservation, and that they should advocate for native forests and be suspicious of large blocks of monocultural plantings of species, especially those not native to the vicinity.¹⁴

HR: ANW members were always strong advocates of regulated deer populations (“*Wald vor Wild*”), which are a main precondition for the development of mixed-species *Dauerwald*. A recent German research project called BioWild, coordinated by the ANW organization, deals with the effects of different deer-hunting strategies on plant biodiversity of several forest communities. The topic has gained interest in recent years in the context of efforts for climate change adaptation.

JG: In addition to Leopold, foresters working in cutover yellow pine stands in the southern United States studied the *Dauerwald* method in the 1930s.¹⁵ There was an effort at the Harvard Forest in the 1930s to develop management practices modeled on *Dauerwald*,

to study natural processes in forest stands and apply that knowledge in the development of silvicultural practices appropriate for forest types in the region.¹⁶

The Schenck influence and the Hawley reports, Leopold’s visit, the interest of American scientists, and visits to Germany from university students and professional foresters: all reveal a strong interest and curiosity in the United States about *Dauerwald* in the 1920s and early 1930s. Even my uncle visited the Black Forest in the last year of his college forestry education in Pennsylvania in the late 1920s! *Ach, du meine Guete!*

HR: After that period, politics may account for the weak exchange of *Dauerwald* ideas and experiences between Germany and the United



Tops from the Pioneer Forest's harvested trees—cut in Shannon County, Missouri—are left in place to decompose.

States. A stigma attached to the approach from its brief adoption by the National Socialist regime. *Dauerwald* principles were dictated to the foresters by the government from 1933 until 1937. The traditionally deep, romantic “forest feeling” held by many Germans and the holistic ideas of Möller were exploited for the early ideological propaganda campaigns.¹⁷ *Dauerwald*, the “permanent forest,” fit the new notion “eternal forest” (*Ewiger Wald*), which was considered a metaphor for the eternal German nation.¹⁸ One motivation was obviously to win over the noblemen with large forestlands, who were often attracted by the *Dauerwald* concept, to the National Socialist party.

The prescribed *Dauerwald* approach to forestry during early National Socialist times in Germany failed, for several reasons.¹⁹ First, the dictation of management practices led to an aversion to it among some influential practical foresters. One prominent example is the Baden head forester L. Leiber; others were academic lecturers (mainly A. Dengler and E. Wiedemann, who were opponents of the *Dauerwald* approach since Möller but were members of the National Socialist party). Second, natural regeneration of the forests was difficult because there was political pressure to maintain dense populations of roe and red deer and other game species. Third, to increase wood supply prior to the war, target diameters were reduced to a level that caused overlogging of many forests: the prescribed cutting quota was raised to 150 percent of the sustained yield! And so the few years of this

interrelation between *Dauerwald* principles and National Socialist politics led to a large setback for close-to-nature forestry in Germany.²⁰

JG: A modern U.S. review by Schabel and Palmer in the *Journal of Forestry* captured much of the best ideas of Möller and his critics.²¹

HR: Hans Schabel was born and educated in forestry in Germany, emigrated to the United States and worked from 1973 to 2006 as a professor of forestry and director of international resource management at the University of Wisconsin–Stevens Point. He made frequent visits to Germany with his students. The late Siegfried Palmer was a German expert for close-to-nature silviculture and adapted forest management plans. He was an advocate of *Dauerwald* and a committed mentor of ANW.

JG: In 2001, Schabel followed up on Leopold's “Deer and *Dauerwald* in Germany” articles with a progress

report in the *Wildlife Society Bulletin*.²² At least for the time being, he reported, in the last years of the twentieth century, maintaining deer populations in at least one-third of German forests has become less important than recovery of the forest. “Wald vor Wild.” I assume that Leopold would approve.

HR: ANW is keenly concerned about the influence of deer in the forest. We strongly believe in “Forests first, ungulates second.” Native vegetation should regenerate without artificial protection from ungulates. In Germany, we have many species that can be affected by browsing, especially oaks and silver fir, which can be very badly damaged.

JG: I’m not aware that the Pioneer Forest has a problem with deer browsing to the extent that regeneration is adversely affected. The forest has an open recreation policy—people are welcome to hunt and fish—and the L-A-D Foundation has easements with the National Park Service to provide access to the Current River and Jack’s Fork River for water-based recreation.²³

HR: My concluding opinion is that Pioneer Forest is an impressive long-term example of successful uneven-aged forest management in mixed oak-pine forests—by no means an easy feat! It is similar in several ways to the ANW style of *Dauerwald* in Germany. And I am convinced that foresters and forestland owners of both countries with the same close-to-nature attitude can learn from each other, with their different approaches.

JG: I know that ANW was founded in 1950 as a working partnership of forest stakeholders to practice multifunctional and environmentally friendly forestry. Isn’t it a remarkable coincidence? That’s the same year when Leo Drey began to acquire the Pioneer Forest lands, and very much for these same reasons. It’s interesting that over nearly seven decades of management,

the operations at Pioneer Forestry seem in more ways than not to embody the *Dauerwald* principles.

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NOTES

1. U. E. Schmidt, “German Impact and Influences on American Forestry until World War II,” *Journal of Forestry* 107 (2009): 139–45. Schmidt provides an excellent and detailed synthesis of the German influence on American forestry prior to World War II.
2. Carl A. Schenck, *The Biltmore Story: Recollections of the Beginning of Forestry in the United States*, ed. O. Butler (St. Paul, MN: American Forest History Foundation, Minnesota Historical Society, 1955).
3. C. A. Schenck, *Biltmore Lectures on Silviculture* (Albany, NY: Brandow Printing Co, 1907).
4. H.-E. Biolley, “The Jardinage Cultural,” *Journal forestier suisse* 52 (1901): 97–101, 113–32.
5. Char Miller, *Ground Work: Conservation in American Culture* (Durham, NC: Forest History Society, 2007).
6. B. E. Fernow, *A Brief History of Forestry in Europe, the United States, and Other Countries* (Toronto: University Press of Toronto, 1911).
7. K. Gayer, *Der gemischte Wald, seine Begründung und Pflege insbesondere durch Horst- und Gruppenwirtschaft [The Mixed Forest, Its Establishment and Tending Especially with Groups]* (Berlin: Verlag Paul Parey, 1886).
8. A. Möller, “Kieferndauerwirtschaft I” [*Dauerwald Forestry with Pines*], *Zeitschrift für Forest und Jagdwesen* 52 (1920): 4–41; and A. Möller, *Der Dauerwaldgedanke, sein Sinn und seine Bedeutung [The Dauerwald Concept, Meaning, and Significance]* (Berlin: Springer Verlag, 1922).
9. R. Hawley, “The Continuous Forest: A Review of Several Articles Appearing in German Forestry Journals, 1920 to 1922,” *Journal of Forestry* 20 (1922): 651–61.
10. R. Troup, *Silvicultural Systems* (Oxford, England: Clarendon Press, 1928).
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