[redacted]

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Scoping Comments of [redacted] RE: The "Sunny Oaks" Project

I. Introduction.

The Sunny Oaks project could be an opportunity to bolster the Wayne National Forest's wildlife carrying capacity and long-term health and resiliency. If the mature oak components of the proposed harvest units are fully retained (and released of competing non-oak canopy), extensive early successional habitat can be created while optimizing wildlife values, aesthetic values, and oak regeneration and restoration potential.

On the other hand, removal of the mature oak component in these stands will materially reduce the Wayne's wildlife carrying capacity, its resiliency, and its ability to regenerate future oak cohorts. Oaks are the keystone species in the forests of southeast Ohio. Sensible, science-based active management is needed to ensure they maintain and expand their future position in the forest. This entails the repeated use of prescribed fire to push back competing, less desired tree species. It also includes the consideration of important data points, including: site index, slope aspect, moisture index, light penetration, vegetative competition, and size and number of advanced reproduction. Successful management will require the use of the aforementioned data to write and implement prescriptions like thinning and two-aged shelterwoods that permanently retain mature oak overstory.

However, clearcutting is not the optimum method of restoring oak, nor of assisting in the recovery of ruffed grouse habitat in oak-hickory stands in this portion of the bird's range. (See literature citations, *infra*). While clearcutting these stands would likely provide the greatest dollar return and the greatest unit output of timber, there are far superior methods of commercial and non-commercial harvest for the purposes of oak and ruffed grouse restoration. Therefore, if implemented, the clearcutting proposed in the Sunny Oaks Project would violate the National Forest Management Act (NFMA) 16 USC 1604(g)(3)(E) & (F) and the 1982 and 2012 Forest Planning Rules.[1, 2]

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[1] See, e.g., 16 USC 1604(g)(3)(F)(i): "clearcutting […] and other cuts designed to regenerate an evenaged stand of timber will be used as a cutting method on National Forest System lands only where—(i) for clearcutting, it is determined to be the optimum method […] to meet the objectives and requirements of the relevant land management plan."

[2] The inclusion of clearcuts in excess of 40 acres could also violate the NFMA, the 1982 Planning Rule, and the 2012 Planning Rule, which requires provision for clearcuts of this size in plan components and for public notice and regional forester review on an "individual timber sale basis." 36 CFR 219.11(4)(ii) (2012); 36 CFR 219.27(d)(2)(ii)

II. USFS Should Analyze and Adopt a New "Optimum Oak Alternative" that Maximizes Wildlife and Oak Values.

We request that USFS consider and adopt a NEPA alternative that requires, for all harvest units associated with this project, the full retention of all mature oaks capable of producing seed. This would entail the creation of what are essentially two-aged stands with a permanently retained oak overstory.

This "Optimum Oak Alternative" would create thousands of acres of early successional habitat while optimizing present and future oak and hard mast values, wildlife carrying capacity, and reproductive outcomes for critical species like white oak, ruffed grouse, black bear, and cerulean warbler. This alternative would also be capable of generating substantial, albeit non-oak, timber volumes and revenues. The Wayne will be a stronger and more resilient forest if USFS keeps the oak in its "oak restoration" efforts.

Unless wildlife resources indicate otherwise, we strongly encourage USFS to employ multiple low-intensity prescribed fire treatments to all harvest units to facilitate oak reproduction and discourage competition from less desirable species.

In addition, for each harvest unit proposed, USFS should disclose all data it has available pertaining to the following factors: moisture index (IMI), site index, slope aspect, per-acre or ha numbers and size of advanced oak reproduction, status of competing vegetation (e.g., red maple and tulip popular), any and all previous treatments (e.g., thinnings, prescribed fire, etc.). This data is important for USFS and the public to effectively evaluate the oak regeneration potential of the stands in question. The maps thus far provided for this project show many clearcut and shelterwood prescriptions on predominantly north, east, and northeast-facing slopes. This does not bode well for successful oak regeneration, absent not-yet-provided mitigating information.

III. Sample of Oak Literature Support for the Optimum Oak Alternative.

While white oak (*Quercus alba*) was once *the* dominant tree species in Ohio,[3] it is in a state of serious decline today and is being harvested unsustainably in the state. White oak is second only to white ash in volume loss since 2011 at 7.3% loss; removals exceed annual net growth at 0.8:1 [G:R].[4] Ohio's public lands – in particular, the Wayne National Forest and the Ohio state forest system, are our best hope for the recovery of white oak populations. Given *Quercus alba*'s status as the premier wildlife (and charismatic) tree in Ohio and its steep declines, the Wayne's pending forest plan revision should implement a forest-wide standard requiring full white oak retention.

White oak experience greater predation than dispersal by animal agents, which predisposes them to establishment under parent trees. Oak Forest Ecosystems: Ecology and Management for

(1982). See also, **G-FSM-WLF-1: "**Temporary openings in the forest canopy, resulting from even-aged timber harvest, should vary in size from 2 to 30 acres."

[3] Witness tree records suggest 40% white oak presettlement forest composition in southeast Ohio; 15% composition today. "Where Has All the White Oak Gone?" Marc D. Abrams, *BioScience*, Volume 53, Issue 10, 1 October 2003, Pages 927–939, at Tables 1 and 2: https://academic.oup.com/bioscience/article/53/10/927/254898.

[4] (FIA) Forests of Ohio, 2016: https://www fs fed.us/nrs/pubs/ru/ru_fs139.pdf.

Wildlife (2002), p. 183. Because white oak acorns germinate in the fall, they are typically not dispersed long-distances by animal agents such as jays. Unlike red oaks, white oak reproduction generally remains in clumps near and around parent trees. This is evidenced in the greater clumping of white oak seedlings and adult trees, and in the greater shade tolerance of young white oaks. *Id*. at 193. Consequently, removing mature white oak can permanently elminate or reduce its spacial footprint in a given stand. In addition, mature white oak are especially poor at sprouting,[5] and stump sprouts from mature white oak cannot be relied upon to form meaningful components of regenerating stands.

In no particular order, the following citations provide substantial further support for the retention of all mature oak trees in the Wayne's proposed Sunny Oaks Project:

Burns & Honkala (1990) Silvics of North America. Vol. 2: Hardwoods. USDA For. Serv., Agri. Handbk. 654, Washington, DC. 877 p.

- White oak -- White oak is generally classed as intermediate in tolerance to shade. It is most tolerant in youth and becomes less tolerant as the tree becomes larger. White oak seedlings, saplings, and even pole-size trees are nevertheless able to persist under a forest canopy for more than 90 years.
- White oak usually becomes dominant in the stand because of its ability to persist for long periods of time in the understory, its ability to respond well after release, and its great longevity.

Iverson, L. R., T. F. Hutchinson, M. P. Peters, and D. A. Yaussy. (2017) "Long-term response of oak-hickory regeneration to partial harvest and repeated fires: influence of light and moisture." Ecosphere 8(1):e01642.10.1002/ecs2.1642

- "an intermediate level of light appears to be optimum for oak regeneration relative to other species." P. 2
- 13-year longitudinal study over two large areas in southeast Ohio. The study evaluated the influences of topography, moisture, burn intensity, partial harvest, and competition on regeneration response.
- Light levels greater than 6% open sky were frequently sufficient for successful oak-hickory advancement. 19
- "partial harvests and repetitive burning can greatly bolster the chances of acquiring adequate stocking of competitive oak-hickory in the advanced regeneration." 19
- Key findings and recommendations: "multiple fires are necessary to retard resprouting and regrowth of competing vegetation; […] increase canopy openness to between 6% and 18%--less light prevents oak-hickory growth while greater light levels may favor shade-intolerant competitors; […] success is much more likely on intermediate and dry moisture regimes (IMI < 47) and that implementing harvest and fire on mesic sites to promote oak-hickory regeneration is less likely to be practical." P. 20

[5] GOULD, P.J., S. FEI, AND K.C. STEINER. 2007. Modeling sprout-origin oak regeneration in the central Appalachians. Can. J. For. Res. 37(1): 170 –177, at 175 (noting white oak experiences a rapid loss in sprouting ability with increasing diameter).

Dey, Daniel C., “Sustaining Oak Forests in Eastern North America: Regeneration and Recruitment, the Pillars of Sustainability,” For. Sci. 60(5):926 –942 (2014) http://dx.doi.org/10.5849/forsci.13-114

- Substantial acorn yields begin at about 40 –50 years of age in eastern oaks (Burns and Honkala 1990).
- However, clearcutting on productive sites (e.g., oak site index 21.4 m) usually accelerates succession to a mix of shade-tolerant species from large advance reproduction and fast-growing shade-intolerant species arising largely from seed or young advance reproduction.
- Other benefits of thinning in developing oak forests have been demonstrated by Healy (1997), who found that acorn production of individual oaks was increased after stand basal area was reduced by 50% through removal of nonoaks and thinning from below in 40-year-old forests in Massachusetts. Thinning did not reduce stand-level acorn production capacity in years of good production compared with that in unthinned stands, but it did increase production in years of low acorn production. P. 933

Schweitzer, Callie Jo and Dey, Daniel C. “Forest structure, composition, and tree diversity response to a gradient of regeneration harvests in the mid-Cumberland Plateau escarpment region, USA.” Forest Ecology and Management, Vol, 262, pp.1729–1741, 2011.

- Noting the ineffectiveness of clearcutting as an oak regeneration method, and recommending shelterwood harvest with post-harvest control of competing vegetation. P. 1737-1738.

Rebbeck, Joanne, et. al. “Do chestnut, northern red, and white oak germinant seedlings respond similarly to light treatments? II. Gas exchange and chlorophyll responses.” Canadian Journal of Forest Research, Vol. 42, pp. 1025-1037, 2012.

- Finding “no additional benefits to increasing light above that typically found in a light shelterwood cut,” and, even then, “it is crucial to control faster-growing competing vegetation.”
- “Optimizing light levels in the forest understory to allow oak advance regeneration to survive and thrive without promoting faster-growing competitive stems is crucial for maintaining sustainable mixed-oak ecosystems in the eastern United States.” P. 1030.
- White oak seedlings allocated about three times more carbon to root systems than did chestnut or northern red oak seedlings. White oak seedlings were also able to maintain a positive carbon balance in dense shade. 1032. White oak had the lowest respiration rates, and had maximum carbon exchange rates in 6% of full sun. 1034.
- For all three species, “the light saturation point of photosynthesis occurred between 18% and 25% of full sun, although white oak grown at lower light levels displayed some plasticity. […] This suggests that the photosynthetic capacity is saturated with no additional benefits afforded to oaks. If light levels are higher, only faster-growing shade intolerant competitors such as red maple and black cherry, which display more plastic growth responses, would benefit.” P. 1035
- “White oak’s physiological attributes as well as its slow growth and extended longevity (up to 600 years) support a survival strategy that is unique to that of other upland oak species.” 1035

- “To target white oak seedling regeneration, we propose that light levels need not be increased above 18% of full sun; to target chestnut and northern red oaks, light levels need not be increased above 25% of full sun. These light levels could be achieved by cutting 35%-40% of the stand basal area in a shelterwood harvest.” 1035 And, several rounds of prescribed fire would be required to reduce or eliminate non-oak competition prior to any thinning or removal of retained overstory.

Povak, Nicholas A., et. al. “Altering successional trends in oak forests: 19 year experimental results of low- and moderate-intensity silvicultural treatments.” Canadian Journal of Forest Research, Vol. 38, pp. 2880-2895, 2008

- “Commercial clear-cutting, with or without prior herbicide spray of low vegetation and oak underplanting, resulted in nearly complete dominance by a wide array of non-oak species on both mesic and dry-mesic sites. In contrast, 153-903 ha^{-1} of the oaks that were underplanted on shelterwood – understory removal plots successfully achieved dominant or codominant status by age 19.” At abstract.

Yeagle, Jessica A.; Groninger, John W., “Long-term effects of clearcutting on tree species composition in an oak-hickory forest,” 538-539 (2006); in Connor, Kristina F., ed. 2006. Proceedings of the 13th biennial southern silvicultural research conference. Gen. Tech. Rep. SRS–92. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 640 p.

- (Surveyed results of clearcut on upland southern Illinois oak hickory forest. 30 years after harvest, disturbance-dependent species such as oak appeared to be decreasing while mesic species were increasing).

Gould, et al. (2002) “Regenerating mixed oak stands in Pennsylvania: A quarter-century perspective.” P. 254 –258 in USDA For. Serv., Gen. Tech. Rep. NC-234, North Central Research Station, St. Paul. MN.

- The frequency of white oak decreased from 89.2 percent of stands before harvest to 58.3 percent of regenerated stands. P. 256
- Table 2 on p. 256 – relative basal area of oak went from 77.7 to 30.2%.
- Study examined 90 stands that had been regen harvested 20-33 years prior.

Stringer, Jeffrey W. 2002. Oak Regeneration Using the Two-Age System. In: Gen. Tech. Rep. SRS-48. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. pg. 379-382

- A traditional clearcut essentially stops sexual reproduction in the stand for a substantial portion of the rotation and can limit the potential for the development of viable advanced regeneration. The reserve trees in the two age system provides for the potential for continued sexual reproduction in the stand and the ability to develop advanced regeneration[.] p. 379
- Analysis of released treatments vs. uncut (unreleased) treatment showed a highly significant difference ($p = 0.008$) in acorn yield (as expressed on a per tree basis). Released trees annually averaged 1,424 grams of acorns per tree compared to 689 grams per tree for unreleased trees. This indicates that fully released trees, typical of those that would be retained as reserve trees in deferment cuts in white oak dominated stands, have

the capability of not only maintaining but improving acorn yield, a prerequisite for the development of advanced regeneration in two aged stands. P. 380-381.

IV. Sample of Wildlife Literature Support for the Optimum Oak Alternative.

A. <u>Ruffed Grouse</u>

Oak mast production is the minimum limiting factor for ruffed grouse population growth in the Central Appalachian portion of its range, including Ohio. Maximum mature oak retention in early successional prescriptions is the optimum management strategy for maintaining and growing ruffed grouse populations in Ohio. Conversely, removing mature oak from the overstory will negatively impact ruffed grouse population potential in the forest. See below for a sampling of literature supporting the Optimum Oak Alternative:

Benjamin C. Jones and Craig A. Harper, Ruffed Grouse (*Bonasa Umbellus*) Use of Stands Harvested Via Alternative Regeneration Methods in the Southern Appalachians
Proceedings of the 15th Central Hardwood Forest Conference e-GTR–SRS–101

- Finding grouse benefited from shelterwoods, irregular shelterwoods, group selections, and mature oak and mesic hardwood stands.
- "An advantage of shelterwood and irregular shelterwood over clearcutting is retention of mature mast producers, especially oaks, for some time after harvest. Following clearcutting, there is a 25-40 year time lag in seed production, requiring grouse to forage and seek cover in different areas. With shelterwood and irregular shelterwood, hard mast and cover are available within the same stand creating optimal foraging conditions. […] Increased growing space also may result in greater acorn production by residuals (stringer 2002). In a West Virginia two-aged stand, Miller and Schuler (1995) also noted regeneration of additional species important to wildlife, including American hornbeam, flowering dogwood, pin cherry, serviceberry, and wild grape. […] [G]rouse use of shelterwood and two-aged stands likely resulted from a combination of desirable midstory structure and food availability." P. 379
- Summer broods favored group selection openings, and unharvested mature mixed oak hardwood stands that had natural, mortality-caused canopy gaps. P. 379.
- "For plans concentrating on grouse habitat (and other wildlife in general), retention of mature trees in both the white and red oak families will decrease probability of mast crop failure in a given year. Retention of other trees and shrubs including flowering dogwood, black gum, serviceberry, pin and black cherry, and witch hazel can prove beneficial without negatively impacting growth of commercial species (Miller and Schuler 1995). P. 380.

Devers, et al., "Ruffed grouse population ecology in the Appalachian Region," The Appalachian Cooperative Grouse Research Project (ACGRP) (2008), Wildlife Monographs, Vol. 168: 1-36.

- Hard mast production in oak-hickory forests is the primary influence on ruffed grouse reproduction. page 22
- Ruffed grouse in the Appalachians rely heavily on hard mast production. 22
- Percent carcass fat of female ruffed grouse is positively correlated with chick survival 35 days posthatch, and female carcass fat levels are tied to hard mast production. 23

- "during years of poor hard mast production, ruffed grouse may forgo breeding and invest endogenous reserves into survival and future breeding attempts. Finally, in springs following poor mast production, chick survival is low (regardless of environmental conditions) due to poor egg quality and weak chicks. In springs following above average mast production, chick survival increases, presumably because larger chicks are produced with a greater amount of energy reserves in the form of remaining yolk." 24
- Reproductive rates are lower to begin with in oak-hickory forests of the Appalachians because grouse lack the more northerly and mesophytic food sources, especially aspen, common to the core of their range. See 26.
- Productivity (chick survival and fecundity) had the strongest influence on ruffed grouse population growth rate in the central Appalachian region. […] Our results indicate management agencies will be able to increase ruffed grouse abundance most efficiently by focusing management efforts on increasing fecundity, particularly chick survival." 29
- Ruffed grouse home range size and selection for preferred habitat features were related to hard mast production in oak-hickory forests. 29
- We believe food quality and availability may be the minimum limiting factor affecting ruffed grouse populations in oak-hickory forests of the southern and central Appalachians. Multiple aspects of ruffed grouse ecology in oak-hickory forests appear to be related to hard mast production including habitat selection, pre-breeding body condition, and reproduction and recruitment." 30
- Recommending management efforts focus on habitat management designed to increase population growth "by increasing food abundance," because lack of early successional habitat in the region is not the minimum limiting factor – lack of hard mast is. 30
- "Acorn production from red and white oak species appears to be the most important ruffed grouse food resource in the Appalachian region, consequently land managers should pursue silvicultural practices that increase acorn production. 31
- Recommends that natural resource agencies in the Appalachian region implement a standardized, annual hard mast survey. 32

Harper, et al., "Managing Habitats for Ruffed Grouse in the Central and Southern Appalachians," Virginia Department of Game & Inland Fisheries; available at: https://www.dgif.virginia.gov/wp-content/uploads/ruffed-grouse-habitats.pdf

- "Clearcutting oak-hickory stands creates high stem densities desirable for escape cover, however, mast production is eliminated for approximately 40 years. Even then, mast production will not equal that of the previous stand if oaks are underrepresented in the regenerating stand." 4
- "The benefits of shelterwood harvests over clearcutting are the retention of mature, mast-producing oak while advance regeneration is developing, provision of oak in the future stand, and retention of mature trees for aesthetic purposes. Acorns are a nutritious food that can influence survival and recruitment of Appalachian ruffed grouse. Therefore, stands that intersperse mature oaks with woody sapling cover will benefit grouse in the region." 7.
- "**an irregular shelterwood that retains the residual overstory for at least 30 – 40 years (until the regenerating stand begins to produce mast) is the best regeneration method to improve habitat for ruffed grouse when harvesting oak-hickory stands in the central and southern Appalachians.** Our research indicated a strong inverse

relationship between grouse home range size and mast crops in oak-hickory stands. When stands are clearcut, there is a time lag in hard mast production while trees mature (at least 30 – 40 years). During that period, grouse must balance time spent in early successional cover and time spent foraging among mature oaks. Two-age stands provide both food and cove, allowing grouse to forage on acorns and other foods without increasing risk of predation." Page 9 (emphasis in original).

- "Considering harvesting economics, some managers recommend larger cuts, up to 40 acres or more. […] However, *because interspersion of quality habitats within a relatively small area* is the most important consideration when managing for ruffed grouse, harvest units should be relatively small (less than 25 acres with even-aged and two-aged regeneration methods)." (emphasis in original) Page 36.

Jones, Benjamin C. and Harper, Craig, A., "Ruffed Grouse (Bonasa umbellus) Use of Stands Harvested Via Alternative Regeneration Methods in the Southern Appalachians," Proceedings of the 15th Central Hardwood Forest Conference (2007), pp. 379-380 (recommending irregular shelterwood with oak retention over clearcutting for ruffed grouse management).

Whitaker, et al., "Factors Associated with Variation in Home-Range Size of Appalachian Ruffed Grouse (Bonasa Umbellus)," The Auk 124(4) (2007), pp. 1-18 (recommending management prescriptions that increase hard mast for grouse; noting fall-winter range expansion of >2.5x following poor fall hard-mast crops).

Jones, et al., "Ruffed grouse brood habitat use in a mixed hardwood forest: Implications for forest management in the Appalachians, Forest Ecology and Management 255:3580-3588 (2008) (finding brood preference for small gaps in mature stands, and the shaded periphery of even-aged openings; finding ideal brood usage conditions at 75% canopy closure).

B. <u>Bear, Turkey, and Deer</u>

Acorns, especially those of *Quercus alba*, are the single most important food source for black bear in the Appalachians. Reproductive numbers and success of black bear are tied closely to white oak acorn masting patterns. In addition, when given the choice, black bear prefer to winter den above ground in large cavity trees – in large *oak* cavity trees, specifically. <u>Oak Forest Ecosystems: Ecology and Management for Wildlife</u> (2002) at 224 – 240. The American black bear is a RFSS for the Wayne. See **SFW-TES-32 "**Protect and improve occupied Regional Forester sensitive species habitat."

Deer antler point number, beam diameter, and length are all significantly related to acorn yield. McShea and Healy at 218.

Acorns represent the highest volume of food in the eastern turkey diet during the winter and spring. McShea and Healy at 242.

V. Conclusion.

We all want a strong, resilient, and healthy Wayne National Forest that is at its best for people and wildlife. To that end, [redacted] respectfully requests USFS' consideration and adoption of a project alternative that retains all mature oak trees (i.e., resulting in two-aged stands with full and permanent oak retention). This is the only alternative that can optimize the forest plan's vital oak and wildlife restoration goals while still producing substantial timber volume.

Thank you for considering our scoping comments on the Sunny Oaks Project. I will send you copies of all literature cited under separate copy for your convenience. We look forward to carrying on a productive dialogue with you as the NEPA analysis for this project continues.

Sincerely,

[redacted]