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Following comments are responding to the 2024 Big Piney Burning and Habitat Restoration project. The scale of the burn units and of the project itself demands an EIS and time for on-site inspection by the public. The Ozark Vegetation Management Project (a forest-wide project to determine what is appropriate management based on a revised inventory and accessment of forest conditions) is being put on hold in the October SOPA, while this project is being pushed ahead to compromise the OVM or render it moot. The implied need and purpose is for the sake of management itself and to award contracts to support high tech agri-forestry by de-facto conversion from hardwood forestry to a pine tree farm (culling oaks and planting pine amidst burnt stumps) — Turning ginseng woods into a toilet paper factory. The obvious purpose is to create a disclimax — a condition of continual disturbance on unpredictable timing requiring ongoing management with frequent erasure of previous mistakes only to make bigger ones. Catering to the industry the forest service was created to protect remnant forests from, the forest service is scaling up to feed an already bloated industry that has overcut its base and demands more as a reward for corporate greed. The Multiple Use-sustained-yield Act, the Endangered Species Act, the International Migratory Bird Treaty were all resulting from abuses of the landscape and biota.

The habitat you will be restoring is that of the late 1920s and 1930s — dust bowl and depression from landscape-scale conversion of pre-existing conditions. Following the Civil War, tall-grass prairies were converted from free-range cattle and horse operations to plowed farms for row-cropping. The farmers were wiped out in the 1870s by 5 years of insect damage — 2 years of cinch bug plague followed by 3 years of Rocky Mountain Locusts. Half of the farmers in Johnson county, Missouri went bankrupt (where I'm from). My grandpas' uncle commited suicide in front of the bank that had taken the deed to his farm.

The locust swarms that destroyed the transmississippi midwest and midsouth started in the foothills of the Rockies and were eliminated by plowing in Colorado before they emerged. Before the Civil War, there were many centurys of grasshoppers frozen in glaciers in the northern Rockies — prevailing wind was from the south when they swarmed. The shift to the east was an early example of impacts of climate change.

Plowing short-grass prairies in the 1920s was creating the dust bowl and depression. Intense farming on wore-out soils led to quality reduction in food, stunting wildlife and people. With bounties on coyotes and bobcats, and coon hunters wherever corn was grown, hunters killed so many that they could all judge weights. Even so, they killed a big canid they all swore was a red wolf. Taken to a scales, it weighed 29 lbs. Now coyotes are routinely 50+ lbs. Back then a 20 lb coon was huge. Dad was trapping 50+ lbs coons in his barn by the eightys.

The erosion rates quoted for the piedmont don't apply in the Ozarks. Flatter terrain and different soils give different results. More applicable to the project area are USDA Soil Conservation Service county soil surveys for Newton, Johnson, Pope, Searcy and Madison & Van Buren counties.

In all soils, topsoil is the result of biota and its organic remains. The "hazardous fuel" quickly rots to where it won't burn, except in a repeat burn. Hickorys quickly rot once on the ground — those still standing can last longer, but only a few more years. Chinkapins killed by blight in 1970s & 1980s are still solid off the ground. Oaks decline slowly. As Dave Graney explained to me in 1972 seedling oaks planted by humans rarely survive, especially on burnt scarified clearcuts. Squirrels and birds plant oaks that do survive, but only after they have tall enough sprouts and pioneer seedlings for safe nests. Before that they plant edges close to escape cover, so regeneration works inward in rings. So they have to rely on sprouts like coppicing in Europe but with no standards to maintain canopy height.

Oaks decline as the soil does. As they grow, prop roots spread to source organic matter while a tap root goes deep to source water. Mass above and below ground roughly equate. Spread roots then turn up into the topsoil and with fungi form a mycorhizal symbiosis which connects them to proximal trees and shrubs. Dogwoods source calcium, redbuds and locusts fix nitrogen as legumes. Fungi transport to share. Exposure to sun and wind drys out fungi and leads to cascading elimination of soil biota.

Any increase in biodiversity will be from introduced invasives. The bulldozer lines are corridors for invasion by all sorts of biota. At the same time, it is a barrier to soil biota, vertebrates (especially amphibians) hinders dispersal of plants, and concentrates predators. Hawks and owls easily catch prey in the open, while foraging hogs and coyotes can smell trails crossing the barrier and track fresh ones. The compaction caused by the dozer and fire equipment using the ROW and ORV parades (especially deer and turkey seasons) all impact surface and groundwater, re routing runoff and leaching.

Native biodiversity will decline because of the burn, to the point of now-common species going extinct locally or regionally. Overwintering insects and other invertebrates are almost all in the leaf litter and topsoil. So are many small vertebrates (herps, mice, shrews, voles, red and probably seminole bats - I've seen a red bat crawl out of thick leaf litter around rocks and fly off at dusk on a warm day in March) What happened to bobwhite quail when agrichemicals applied in nesting season killed emerging insect larvae that newly-hatched quail need to eat (precocial - hen can't feed chicks) shows how fast a common species can be impacted.

In natural hardwood forests, there is a predictable sequence of species occupying an opening or gap in the canopy - succession. Thoreau wrote an essay called "the Succession of Forest Trees" in the 1850s. The first trees to appear in an opening are the pioneers (sumac, cherry, persimmon, red cedar, black locust, shortleaf pine, hackberry) They'll also be the ones to be repeatedly killed by ROW maintainance. This makes the project area a sink for native pioneer species.

As a population sink, pioneer species will continue to attempt to reclaim the area through birds and small mammals. Aliens invade through human activity, machinery, equipment, vehicles, intentional planting on private land, escaped nursery stock, packing, potting soil, peat, etc. USDA introductions (kudzu, Korean, bicolor, and sericia lespedeza, as etc.) have been failures or threats to native biota. Demanding hybrid, genetically-modified soybeans (so farmers can't save seeds) replaced old-time cowpeas (whip-poor-will, Crowder, black-eye, red ripper) which grow best in poor soil and adverse conditions, and are all open-pollinated.

Invasives are frequently on different timing. Multiflora rose flowers at the same time as other roses, but while they set seeds in summer, multiflora seeds stay green, to ripen next spring in time for migration.

Some pioneer species are valuable (black cherry, locusts, red cedar) and can become depleted in an ongoing population sink, while seed sources are targeted. But all pioneer species cover bare ground and protect what's left of topsoil. Constant exposure with erratic disturbance eliminates topsoil.

The statement that the stands are overstocked yet understory lacks wildlife foods is totally wrong, as is the one that burning improves wildlife habitat. I was at an ethologists' world conference in Fayetteville a few years ago (ethology is the study of behavior) when Robin Shoaf (recreation officer for Ozark N.F.) was giving a slide show as required for his masters'. Defending burning, he showed a slide of Ives Knob on Pilot Rock Mountain after a burn that spring. For reference, he showed a CCC rock culvert by the road in sharp focus with a blurry sea of green on the hill behind it and talked about how quickly wildlife food plants recover or recolonise after a fire. I had seen that same hillside over the same rock culvert the week the picture was taken. The green blur was bracken fern — toxic poison for wildlife or livestock, and one of the first plants to dominate after a burn. Doesn't take much to fool city people so Robin got his degree in deception.

What a tangled web we weave —

The first reason given under purpose and need is correct, although you would consider it a mistake. The shift to intolerant (of shade) species is a result of overcutting and clearcuts do contain less native species diversity than old growth. As state research naturalist and "herb doctor" at the Ozark Folk Center State Park and hunter of medicinal herbs, I know that in the 1800s and early 1900s the Ozarks was among the best places in the country for finding ginseng, blue and black cohosh, yellow and white puccoon, wahoo root bark, slippery elm bark, black cherry bark and by far the best place to find golden seal root (also solomon's seal root and several species of Aluminum - at least 2 Ozark endemics and a third Ouachita endemic.+ squawvine. Buyers from Missouri still advertise to buy ginseng every fall in Jasper. The only way it survives is by having enough late successional undisturbed habitats to confuse diggers. (limited acreage natural areas are sure to be dug out) Burning kills magnolias, beech, basswood and other late successional thin barked trees. Scaling biodiversity to a regional level, there is an abundance of early successional habitats on private land, including private inholdings. Late successional habitats are becoming increasingly rare everywhere. Most of what remains is in national forests — the bulk of public lands in Arkansas and elsewhere. Eliminating ginseng woods to create more rabbit habitat is underachieving at its worst. Dumbing down to comfort levels of management or to training is a threat to long term survival for many species.

There are in fact plenty of understory species in old growth. Disturbance on the edge of a stand may be as far as your inventory-monitoring crews get. I subcontracted the 1980 Rare Plant Inventory of the Ozark-St. Francis NF from Dr. Gary Tucker for the Buffalo RD. Designed to fail, I had 3 months on foot to cover the entire district. I did in fact find some of the listed plants in new locations, and Gary gave me credit ~~as a botanist~~ and said the Buffalo RD was likeliest to produce future significant discoverys. I've found plenty more since. I've done observations and illustrations of several rare, endemic or disjunct plants, insects or invertebrates, birds, bats, herps, etc. in situ.

Concern for pollinators is valid, but burning eliminates native forest pollinators in leaf litter and dead wood. I've found honey bees (feral) in hollow trees mostly. Real bumblebees (also feral) are ground nesters in hay fields or pastures. What most people mistake for bumblebees are large Carpenter Bees, which nest in dry woodpiles or brushpiles near the ground.

A few years ago, I was observing pollinators of Silene ovata (Blue Ridge = ovate-leaved catchfly) below the bluffline by flashlight (night-flowering). The prominent pollinator was the Deadwood Borer (Scolecampa liburna) which feeds on fungi in decaying logs and stumps as caterpillars. Other pollinators observed were Mournful Sphinx moth (Enyo lugubris — grapevines) Forked Inchworm (Euchlaena pectinaria — cherry) and a Hadena species which was also parasitizing the catchfly seed pods. A Charlottes' Tiger moth caterpillar (Apantheisis carlotta) was feeding on the catchfly leaves and probably pupated in proximal leaf litter. Silene ovata is on the Regional Foresters and Arkansas Heritage lists. Hadena caterpillars eat catchfly seeds inside the seed pods, but don't eat all of the seeds in a pod. I've observed winter wrens eating the whole pods. The wrens digest the caterpillars and disperse the seeds to simularly aspected bluffLines. This explains the "unidentified plant material" found in food habit studies.

It is also a good example of symbiosis and interconnecting biotas. Winter wrens nest at treeline — boreal forests in Canada or high elevations in the Appalachians. They migrate south to the Gulf coast — the Boston mountains are the north end of their winter range. But in the Appalachians they migrate to lower elevations — the bluffs on the Blue Ridge. In the winter, the wrens keep moving to find active anthropods but there seems to be a pattern based on aspect. Late fall and early winter, they are at the catchfly sites — northern and western-facing bluffs. They hold late-afternoon heat longer that time of year (sun angle) By midwinter, they've shifted to south-facing bluffs that warm up quick, and by spring they shift to east-facing (high bluffs below highway 7 north of MacElroy Gap).

Wrens in Arkansas are Canadian — so covered by the Migratory Bird Treaty Act (International) Destroying habitat is a taking leading to reduction of part of the population. Canadian wildfires aren't set deliberately by the government. The lame excuse of hazardous fuel buildup is ignoring the fact that the same material is habitat for many species, on its way to topsoil, if protected.

The first trees commercially cut in Newton county were redcedar. (boards could be floated down the Buffalo to the White river and loaded on White river steamboats.) (1830s on). Cedar shingles outlasted red oak and split easier than white oak, so local use + ports was extensive. In spite of a century+ of cutting, Walter Lackey in his history of Newton county (1950) said cedar once covered south hillsides in many sections of Newton county; up to 18" diameter common. The Eagle Pencil company bought cedar logs at one cent per lineal foot.

Cedar outlives most trees, grows in cleared wasteland or overgrazed and trampled range, resists insects or browsers, and is valuable for dendrochronology. It should be protected while it builds soil and provides food and cover for wildlife, instead of wasted to make room for a pine tree farm. Ecologically, it is especially important for the still air space protected from windchill, the cover provided and the soil condition under it. I've observed winter icestorms in a cedar grove where woodcocks (with soft bill tips) could still forage for native earthworms. (woodcocks are another bird migrating from Canada.)

I'm enclosing a copy of my response to the proposed roadless rule change as part of my response to the 2024 Burn Project. The existing bulldozer lines weren't existing until you got here as district ranger. Some if not all of them could be the first step in clearing for road construction. (ORV's no doubt are already using them whenever convenient) As such, this is project fragmentation — incremental project implementation without disclosure or public process except when attached to misleading propaganda. The "existing burn units" are recent and should have been part of this proposal instead of ignoring the process and public.

The actual fragmentation this proposal will create is an ecological disaster. As is, the Ozark National Forest has more public land within the purchase boundarys than any other forest in the region (except possibly the Ouachita N.F. counting the Weyerhauser stumplands planted in loblolly pine. Most of the original Ozark N.F. was in public domain before acquisition — most of that was never privately owned except for bottomland with a permanent water source. With abandoned farms allowed to grow back, last farming method used determined the response. Row crops (corn, beans, squash) implied burning stubble (white mans' folly) — pine follows fire. Grazed or overgrazed pastures come back in cedar and black locust, haws, plums and persimmons. Almost all farms had remnants of old growth purposely left intact for mast and hunting — too steep or floodprone to farm, but as a reserve for firewood, posts and rails. (sustainable)

A forest is more than a random assemblage of tree species in woodlots that are islands in an agricultural matrix. Through dynamics of the biota a forest has stability and with landscape linkages providing enough connectivity for ongoing dispersal to replace or add to natural biodiversity, sustainability is possible with careful single-tree selection.

The 150' buffer around identified karst features will not protect the catchment which is the landscape at higher elevation. Karst is a feature of the landscape, not just identifiable features for someone driven to measure board feet or cubic biomass. (wearing ecological blinders) If 50' is an option, it will be used for all occasions. 20' from a perennial channel or 5' from intermittant is too close - compaction will reroute flow.

I'm also including another copy of the Indiana bat pole response, which seems to have been ignored. The idea of clearing around known roosts that you have identified makes sure the bats will abandon the site. Look at how long it took you to find the Nuckles creek colony. Even then, and knowing from bat detecters there were more Indianas proximal, they haven't been located. The idea that there's no problem if burns are beyond the "pup season" has no common sense about impacts. Where do young bats go once volant and what do they eat? Forest bats can't just relocate into the regional agricultural matrix and unless they've been poisoned by agrichemicals, there are already bat species in deforested landscapes better adapted to open country.

Northern long-eared bats, like Indianas, day-roost under bark and re-locate to another tree every 3 or 4 days. Indianas roost over 40' up, but long-eared bats roost lower—at risk from blacksnakes as well as fire. Smoke and heat with an updraft will kill or scorch far beyond flametips. Long-ears eat beetles, so fly low and slow. I've seen them foraging as a family unit—spread to cover the dirt road and ROW—head high. I found one in a stack of oak shingles about 3' off the ground under the overhanging root cellar roof, so they can roost low in dry wood, and get scorched or smoked with a ground fire.

Saving known or identified roost trees is assuming you find any and arrogantly assumes you're competent enough and inclined to look for them. Convenient assumptions without proof or logical reasoning are dismissive evasion. Protecting known or identified microsites when inventory projects are on hold is cynical contempt of the process, the biota, and the public.

The obvious purpose and need is to create a disclimax that requires ongoing intense management. Management for it's own sake and ongoing high-tech contracts. No action is in most cases the right action, except when correcting mistakes. Even then, the tendency is to create bigger ones and compound impacts.

What is critical to Indiana bat survival is to maintain natural diversity of woody species in canopy, understory and shrub-seedling stages to maintain the insect diversity and sequencial timing (phenology) for steady ongoing food. Bats eat to fly and fly to eat. Inventory should not only list woody species but also consider the successional/seral stage of the stand and the dynamics and direction of change. Impacts should be minimized and incremental—single tree selection.

What you are calling overstocked stands measured by basal area counts stump sprouts along with canopy and regeneration. Thinning to saw log spacing on crop trees left or planted is assuming total survival until harvest, which won't happen. Mortality and natality are both constant in any healthy population. Dynamics are functions of wildlife and the plants themselves in co-evolved symbiosis and mutualisms more than cut-throat competition.

Thinning or eliminating understory and ground cover or partial canopy removal as in a shelterwood cut doesn't leave enough shelter for the wildlife that plant and disperse them. The habitat you so value to make restoration a priority is rabbit habitat, although the best rabbit has brushpiles around edges of openings. Rabbits will girdle oaks, cherrys and plums the first hard winter. There is already an abundance of early seral stages on private land (both inholdings and private land surrounding the forest statewide as a regional matrix. On the regional scale this is the largest intact mature hardwood forest with connectivity in North America but still an island in a matrix sea of agricultural/urban interface.

Clearing or thinning below the canopy especially on edges lets in wind. Overexposure leads to hypothermia and dessication. Windchill is worse in wet conditions — fog is denser in open woods. In dry weather, wind further drys even shaded ground. Wind also displaces the canopy leaf litter from the fall after a burn. Convex surfaces especially get windswept bare. Concave surfaces trap leaf litter and water to stagnate until enough leaching forms a sinkhole.

Wind is especially hard on amphibians; drying them out in hostile bare ground. The night after a spring rain, the ground is alive with amphibians heading for the nearest water. Tadpoles are near the bottom of the vertebrate food chain, so breeding events have to temporarily overproduce to break even. Timing by moon phase varys with rain. Dry spring weather with wind grounds pollinating insects and amphibians with a resulting mast failure that makes mice and ants more predatory on amphibians. One disaster leads to another, and cascading impacts can impact a population or a web of them to the point of no return (local extinction). A surviving proximal population can be the source for recolonization if it maintains a core — for widely distributed species, no problem.

Salamanders in Arkansas are good examples of fragmentations' long-term impacts. When I was working for the Arkansas Ecology Center in Little Rock in 1977, the director Tom Foti gave me satellite photographs of Arkansas. The Ozarks are a jumble of blocks and ridges with narrow valleys and hollows between; all radiating off the Boston ridge and divide. In contrast, the Ouachitas look like an abstract, impressionest painting with parallel swirls of mountains and valleys trending on the tornado track. (southwest to northeast) Ouachita valleys are wide between steep mountains with narrow ridges. Valleys are agricultural matrix, but now mostly pasture or hayfields.

The salamander genus Plethedon has several species in Arkansas, including state and regional endemics. The Western Slimy Salamander (P. albagula) ranges from the southeast Missouri Ozarks to the Arkansas Ozarks and Ouachitas and eastern Oklahoma with disjunct populations in Oklahoma & Texas. The Ozark Zigzag salamander (P. angusticlavis) is an Ozark endemic but widespread in northwest Arkansas. These two species can cross narrow forested headwaters easily and spread into many watersheds, so there is ongoing genetic exchange in each species and both can take a wide range of habitats. Geology is simple and the same basic rock types are throughout.

In contrast, the Ouachitas have complex Geology and rock types vary. The best habitat for plethedon salamanders is a rocky landslide on the north slopes. The rockslides can cover most of a slope and are damp and shady. The Southern Redback salamander is usually found on lower valley slopes (P. serratus) under logs, rocks, leaf litter and debris. The Rich Mountain salamander (P. ouachitae) is found on Rich and Blackfork mountains; I frequently found them at Queen Wilhelmena State Park on Rich Mountain. The Kiamichi Slimy Salamander (P kiamichi) barely reaches Arkansas from Oklahoma as does the Seguoyah Salamander (P seguoyah) with 1 record from Arkansas. However, the Fourche Mountain Salamander (P. fourchensis) is endemic to Fourche and Irons' Fork mountains and the Caddo Mountain Salamander is endemic to 4 Arkansas counties. Habitats are far disjunct, but can support large populations. With no reason to wander into hostile matrix, isolated populations that survive will have genetic drift into speciation. The absence of isolates is why Ozark Plethodons are only two widely occurring species. The basic rock and soil types occur throughout, as shown in county soil surveys and corridors and other linkages connect habitats. Fragmentation can also lead to extinction if the isolate habitat can't support a viable population.

Appendix B Project Maps disclaimers don't go far enough to excuse deliberate obtusification and confusion. The scale of the project demands better maps with more recognizable features. The faded colors conceal contours (none shown on proposed or prescribed burn areas) which blur at that scale. State highways in red do contrast enough to orient if you know the area and can read the highway numbers. Private inholdings blend into the other faded blur and it'd take a magnifying glass to read road or water or other relavent details. Future maps should go back to USGS topographical maps with 20' contour intervals and each burn should be on a page by itself, even if you have to add 150+ pages. The bulk alone would give a better idea of the magnitude of the project itself. How you can find no significant impact on that scale means you're incompetent to find one or haven't bothered to try. How many of that interdisiplinary team have even set foot on a tenth of the areas listed; let alone your interagency consultants? Hardwood stands aren't uniform in composition, and most that do access the stand never get beyond their ORV. I've consistantly found all sorts of biota you've missed. The scale alone should demand an E.I.S. With inadequate time to think through all of the lies, distortions, misinformation and faulty logic presented and even more neglected or hidden, I can't begin to give an adequate response. However, I did respond to scoping verbally to Janine Book. Since I had other projects to respond to and did (bats, roadless rule) I didn't have time to do so on paper.

Map 1 The Buffalo watershed above the wilderness should not be burned. Cave Mountain itself is obviously underlaid with karst and anything above limestone is still part of a karst system with extensive known caves. On cave mountain road where the foxhunter road meets it, after the last burn and a rain I observed many pebbles on dirt pedicels where rainstrike had eroded the soil around them. Topsoil can't survive exposure to sun, wind, and rainstrike.

Indian a bat habitat (within a nights flight) should not be burnt. Impacts to their food supply are certain, no matter how many experts you bribe, threaten, or ignore. The burn between Kapark road and the wilderness is too steep to avoid damage. Culverts under Kapark road create waterfalls on the wilderness side. and the drop to Nuckles creek is simular. We found ladies slipper orchids, ginseng, golden seal, cohosh and other rare plants on the bike trail below where cave mountain road comes out to highway 16. I found a clubmoss on Dixon Ridge road that had been collected by a late friend at Fallsville 20 years before in UofA herbarium.

Map 1 continued I was on Reeves Mountain road a few years ago when USFS first burned Felkins creek. All I saw was clouds of smoke but a monitoring group from U of A. Fayetteville saw a big flock of red bats flushed out of the leaf litter near them. Some of the bats circled over the spot where they'd been (fidelity to hiburnaculem) until they were scorched by rizing heat and fell into the fire. I was told about it by the director of Biological Sciences at U of A.

Before that, I'd been standing in the old barn lot behind the garden at sundown on a warm day in March when I saw what looked at first like a chipmunk crawl out of thick leaf litter covering the barn cornerstones and scrambled up a plum tree growing in the rocks. I realized it was a red bat as it flew off and circled the plum before flying up to the pond, so the behavior was consistant. Keep your bearings so you can get back before freezing. (when pond insects quit flying).

I was at Roland Cave at 56 in late winter another year when Sylamore district ranger Jim McCoy was burning not far away above Gunner Pool. The Indiana bats weren't stirring, but a lone silver-haired bat was flying 5 or 6 feet over the spring branch above where it ran into the cave, eating midges swarming above the water. We watched it tack back and forth from the CCC picnic table to the cave but not going into the cave. Instead, when it wore out it landed on a linepost-sized tree and crawled around to get under a dead hanging branch. I got a quick sketch of it before it flew back to tacking. In a few more minutes it landed again — on a blackberry top by the bank of the spring where it rested until it went back to work. I figured it was likely burned out of leaf litter on McCoy's burn and was wore out by the time it got to the spring branch. A friend on Cave Mountain had a silver-haired bat sleeping in a bucket inside her house! They're known to hibernate in old abandoned houses elsewhere, so it may not have escaped from the burn (although likely, accounting for being wore out)

Map 2 I looked at the Case cemetary road and burn awhile ago when we were tracking a panther and at least 2 cubs (different sized tracks together.) What was left of a still below a waterfall was the sign of historical human impact. The dozer lines and burns fragment the roadless area on Dismal Creek. I was hunting herbs on Dismal Creek when I almost stepped on a bear cub. It squalled and went up the nearest tree; another cub I heard crashing through thick black cohosh before it treed. I kept walking as the mother bear came running to the base of the tree the cub was in and stood snapping her teeth. I crossed Dismal and got into fine timber. Bears need a lot of roadless space to avoid urban interface in Walnut valley or on 16. Altering bear behavior with this level of disturbance isn't safe. Smokey might take his shovel to you if you insist on learning the hard way.

Map 2 continued The Cooley Gap burn appears to include the Glory Hole. The beech woods below the hole are a big part of the glory. While you're there you should clean up the dump below the west end of the parking lot and put up some kind of outhouse like you've neglected to do at the hawksbill after we recommended it when we finally got you on site. (years ago) You seem to find money for all those new bulldozer lines but not for sanitation, while the parking lot expands and they're paving in from Boxley. Joanie Mitchels' Big Yellow Taxi song comes to mind — "Don't it seem like you don't know what you've got till it's gone. They paved paradise and put in a parking lot!" But not an outhouse.

The Cooley Gap dozer trail and access road is on the edge of an extreme drop into Cooley creek. I camped one summer with two bloodhound pups on Clayburn point behind the gap. I found a lot of Yellow Mandarin on Cooley and Cole Creek — the farthest west I've found it. (Disporum lanuginosum) It's on Dismal sparingly, but Walnut head waters from Cooley to Possum trot and Bean Mountain where I live is the extent I've found it. It's a wildwood flower from the Appalachians, disjunct in Newton county As an indicator of quality woods it's the best.

Ode hollow lived up to it's name lower down. The burn above it is below pond point on Red Lick Hollow — another place I lived for years in the eighties. It's below Owl Hollow Road on Home Creek but should not be burned. You told Dennis and I that you wouldn't burn Rock Creek after the show-me drive down Parker Ridge road to the Piney and we pointed out the sheer drop into Rock Creek. Maybe it was Mullford who reassured us later but it shouldn't be burnt anyhow.

An 80 year-old deer hunter was lost on Middle Ridge several years ago. The search lasted several days. I had trained bloodhounds then but no transportation and Johnson county had their own bloodhounds so I gave up. I had seen Middle ridge and walked down to Cow Creek off it on some project a few years before. It was extremely steep and brushy after an even-aged cut, so I knew why they called off the search. Eight years later, they found his gun. A burn now just makes more erosion and more brush.

The hand line between Walnut Ridge and Rich Knob is roughly the original Ozark Highlands trail which was part of a 27,000+ acreage burn in one day. Split into 3 ranger districts (Bayou, Buffalo, and Pleasant Hill) to keep each district less on paper, they started a crown fire in old-growth pine on the Ozark Highlands trail, and blackened the sky for days. The fire extended to Cedar creek and beyond on Pleasant Hill district.

Map 3 The Robinson addition burn went down to Steel Creek in Limestone, where it killed the lower north slope in a big stand of umbrella magnolias. The ridge itself had good biodiversity until the Forest Service contracted an El Salvadorian crew to backpack spray Velpar and gave them leaky backpacks. None spoke English; only a couple of women spoke Spanish. The Mexican crew boss gave orders through the women. Importing Indians to abuse when we can't use our own anymore —

Map 3 Coopers bluff South is too steep, and Ive seen bats flying on the road. Lambdin Hollow had a good stand of bapswood on it. Wolf branch on the north side of Lambdin Hollow is very steep with a cave low down just to the side of the creek that could be mudded out after the burn. Wolf Branch Cave just across Big Creek has just been gated by USFWS Its a maternity cave for Gray Bats and breeding cave for Indianas. Gray bats reach the Piney across Hurricane Creek and Davis Knob or down Steel Creek. These burns are in critical habitat for the bats and shouldn't happen..

Map 4 The Cave Creek burn also shouldn't happen. The dozer line in sections 30 & 31 are hard to figure out They connect to nothing shown with burns on both sides. A contract for its own sake? The burns on dry creek, Richland and Falling Water will only make for more landslides, especially off Big Point where the last ones blocked the Falling Water road (may still do) and one on Dry Creek buried the Ozark Highlands trail — now re routed

Im less familiar with the remaining maps so for now will give up on them I have more to say about birds and mammals as dispersers and nesting/denning habitats insects and bat foods but will have to deal with them in objections.

Lastly, I do not tell people when or where I am in the woods and with no vehicle or a broken-down one I walk in or am dropped off. No ginseng hunter wants to be tracked. Ive never sold a root and don't intend to. I leave more than I take and expect to see what I leave to be there next year; not burnt or buried in a landslide. The only way to save ginseng is to save enough habitat to confuse diggers. Minimal habitats will concentrate diggers and they'll eliminate it.

I would recommend that you amend the plan and do some real science, starting with a complete inventory of any stand before you impact it.
Be the responsible official youre supposed to be.

Sincerely

Kent Bonar Kent Bonar
naturalist — Newton County
Wildlife Association

To Director
Ecosystem Management
Coordination

9-18-25
Newton County
Arkansas

I'm writing in response to a radio report of a proposal to change the roadless rule (change to what isn't made clear.) I'm disabled and can't stare at a screen long without bothering my remaining eye, so I'm requesting written hard copys sent by mail the day they're given to the public and given a reasonable response time. The scope and scale of the proposal should demand a full Environmental Impact Statement instead of a mere assessment.

After five years as a Arkansas parks research naturalist, I was a VISTA volunteer for president Carter working with the Newton County Wildlife Association and Ozarks chapter of the Arkansas Seirra Club on RARE II doing roadless area inventory for Arkansas.
In Newton county, we identified two more areas now official designated wilderness (Hurricane, Richland) and a third which is now a wilderness study area (Dismal Creek, where we've since tracked a panther and her cubs) Other areas then and now would qualify by default — long unused roads are listed for reconstruction, private access roads remain after public aquisition, floods landslides, windstorms close roads still listed, etc.

In fact, there are too many roads to maintain already. Wasting machinery, manpower and money to build roads to nowhere (or Hell) is underachieving at its worst. Failing to maintain currently-used infrastructure to build roads for one extraction and then abandonment or just on speculation is incompetent management. Nothing sustainable is left for the future.

There are good reasons why these areas have remained roadless until now. Most were considered inoperable— it costs more to access them than can be extracted. Technological advances (drones, computers, aerial surveillance and spraying) were excuse to drop the inoperable designation, even though costs would far exceed benefits.

A standard excuse for building roads into roadless areas is for fire containment. Dry lightning is the only widespread natural cause of fires but was enough to establish populations of fire dependent species in the Atlantic and Gulf coastal plains, peidmont, and around the Great Lakes, as well as from the rest of the country west of the short-grass prairies.

However, in the Ozarks and unglaciated prairies, lightning is always associated with rain. I've hunted and walked from the Missouri River valley in western Missouri to the Neosho and Cimmaron rivers in Oklahoma and the Ouachitas of Arkansas west of Little Rock, and have seen thousands of lightning-struck trees. Fires in Ozark hardwoods don't get beyond root reach of the trees struck. Cedar and pine stands are more prone to burn, but only when a fire is set.

Native Americans set fires for various reasons. A pine dendrochronologist from the University of Missouri (Guyette) has repeatedly said that there are no natural fires in the Ozarks of any extent— they're all set by humans (accidentally or deliberately). Even so, he found a pine stand in Granny Gap (Ark) with a 250 year + fire history, which the forest service used to claim the Ozarks all had a simular history. In fact, the U of Missouri had the territorial records of Mo & Ark from the French back to the 1600s.

Guyette not only had access to the territorial records, but controlled access by anyone else. The Osage claimed the Ozarks as hunting territory and fought the Chickasaw in the Ouachatas. The Chickasaws frequently raided into the Ozarks by way of Granny Gap, where a good campsite was by a spring. The Osage often used the camp on their way south to raid the Caddo on Red River. Whichever was there first was set up for attack from below with fire, and would leave their fires going when they left. Warfare left fires behind it, and around villages which were burnt around for defense, for crop fields and for pasture for horses after Europeans. Villages had to be near a dependable water source so were in bottoms or second bottoms. Fires, clearing and constant use impacted the catchment and the water supply dries up. At that point, the village moves to the nearest source and lets the old site recover as hunting ground. Canebrakes burnt easily but provided winter food for horses, so fires were kept small. So the French records let Guyette find a site with 250+ year burn history. Natural stands on a lightning ridge might have a few acres of comparable age, but pine doesn't get much older. Red cedar does and their presence throughout proves major fires weren't happening for most of the Ozarks.

Europeans increased the number, size and frequency of fires, and most were linked to roads, especially arson (for getting to the site and escaping) In the Daniel Boone National Forest in Kentucky, a stand map of timber types (overlay on topo) shows Scarlet oak-chestnut oak stands as funnel-shaped from a point near the creek bottom and spread to the top whichever way the wind was blowing. Scarlet Oak/Chestnut oak stands grow after a fire in the Appalachians consistently and predictably. Scarlet oak does occur in east Missouri in the French lead-mining district and Crowleys' Ridge in east Arkansas. Anywhere else in the Ozarks it was planted.

Chestnut oak has only been found once in Arkansas (likely planted). Instead of indicators of past fires, the predominant type of dry-land timber is the crosstimbers — belts of timber crossing the tall-grass prairie along the tornado track (SW to NE) Crosstimbers are drought-resistant and can take impacts from grazing, browsing and trampling from herds. They're fire-resistant, not dependent.

As in Kentucky, Ozark fires are started along roads. In Missouri, volunteer firefighters were paid to compensate for time, costs and risks, but soon realized that local communitys were using fires as a frequent shot-in-the arm for the local economy. Even when volunteers weren't paid, trained fire crews looked for job security. They'd all be in church or at a high-school ball game for an alibi while a friend or relative from far away sets the fire.

The forest service employee who set a huge unauthorized fire in Colorado by burning "love letters" at the wrong time and place in the national forest had the lamest excuse to bypass the prescription process. Even so, she started it beside a road. She didn't backpack the letters in and somehow managed to start the fire upwind of the area burnt.

Roadless areas are the safest from arson. Roads themselves can catch fire. Pinpoints of light through a bottle can start a grass fire. Tossed cigar or cigarette butts not only start fires but also attract deer for the nicotene. Florida Key deer were threatened to extinction by highway kill until wildlife managers lured them off the highway with bales of tobacco spread in remote areas (roadless)

Poaching and road kills are major causes of mortality for many species of wildlife. Roads can be designed to minimize losses after a year or two of observation and tracking.

Planting or retaining wildlife corridors to approach safer crossings (overpasses, underpasses, bridges, speed bumps, signs) will reduce roadkills, as will fencing or wall barriers to funnel to them. But the open air space above the road and the heat rising from the road itself attracts swarms of insects, so birds and bats are immediate roadkills along with next years' food potential.

In Europe and Canada, well-designed roads are proven to greatly reduce roadkills, but these roads are expensive, take longer to build and require ongoing maintainance. Roads into a previously roadless area are usually built on a short time schedule because the need is urgent (as percieved by financiers) Road building is done in inflationary times with low interest rates but costs continue to rise unpredictable weather events slow construction and labor demands more. The contractor defaults and the half-built road erodes while the courts sort things out.

To avoid roadkills and adverse human contact, wildlife managers need roadless areas to reintroduce native wildlife by building up a core population to serve as a source for the surrounding landscape. Much of that landscape will be a population sink, but with stable sources the species will reach its long-range potential.

While a road fragments ~~natural~~ natural habitats into disjunct pieces, it also serves as a corridor for invasive species. Birds forage the open ROW, perch on the tallest trees on the edge to rest and process food, then drop into the open space to fly, dropping seeds as they go. Hogs and other livestock (stray or feral) follow ROWs and will track any human trail they encounter, also leaving seeds as they go.

Roads are barriers to some species; filters to others, insignifigant to yet others. No matter what shape the disjunct pieces are, seldom if ever will there be even distribution of necessities between them (water, food, shelter, vegetation, insect distribution) Various trees and shrubs fix minerals and nutrients (for example dogwoods fix calcium, redbuds and locusts fix nitrogen) which are then distributed to other species on site by soil fungi. Road compaction kills Tree roots and fungi and isolates some species from symbiotic partners. Soil biota can't make movements needed within the area. Biodiversity and symbiotic functions decline in a cascading breakdown of mutualisms and food webs.

Colonial species require connectivity to function. Sphagnum and other peat mosses can move water uphill by capillary action from a source but if a road cuts through a colony, the uphill side dehydrates.

Persimmon patches start as clones of one sex. It can't produce persimmons unless both sexes are close enough for insect pollination. They usually do, proving wildlife dispersal patterns are consistant. If a road breaks original dispersal lines of travel, wildlife forced to ajust may disperse seeds to a sink where they're wasted.

Fragmentation of populations into disjunct isolates is the first step in Biodiversity dynamics. Altered behavior is the next. With continued isolation, each group is forced to adapt to availability. Resource partitioning within each group would probably be between sexes, ages and Timing. (season, moon phase, time of day) so that roadkills would vary accordingly. When animals from both sides cross frequently, numbers would raise but partitioning would lessen. Why did the roadkill try to cross the road? To get to the other side.

Roads pollute, impacting the surrounding landscape. Topsoil disappears on exposure and eroding subsoil traps toxins in mud, which dries to dust and goes airborne. Other poisons wind up in the nearest surface water or leach into groundwater. To come out in a spring or well, or get soaked into the ROW. Salt in winter was in runoff from a state highway that was destroying a Mississippian petroglyph site in a Missouri park in the 1970s. Petroglyphs lasting many centurys were disappearing in a couple of decades.

Noise pollution is intense in construction and extraction, after which motorized recreation will damage the remaining roadless isolates to the extent they can, with more noise everywhere. When extraction is the only real purpose, construction will be fast and nothing will last (except scars) Roads on ridges cause landslides below; several are blocking roads below in several counties in the Ozark National Forest now. That could have been prevented if managers had read the SCS county soil survey. What happened to the Soil Conservation Service? Too inconvenient no doubt. Killed by Fertilizer companys likeliest.

As roadless areas are disappearing, each becomes more valuable. Whether we look at Nature as Gods' Creation or as resources to be extracted social greed needs restraint. Leave something for the future. Roadwork should be done to maintain existing roads and completing existing projects. The roadless rule should be strengthened not weakened. Road closures or gating minimizes impacts to other areas while allowing emergency access To a roadless area boundary (ie walking distance from any part of a roadless area.) Off-road vehicles should also be kept out of roadless areas and natural areas. Motors of any kind make noise and pollute and destroy a sense of solitude. There are plenty of places where it won't matter. Stay there.

A thorough biotic inventory of a roadless area should be done before any proposal is put into the public process. All should be getting ongoing incremental inventorys. Plant associations and successional stages should also be inventoryed. Soil and rock type canopy closure, water sources and previous impacts should all be included.

Oversight is needed and should be held responsible as should the contractors. Inspectors should be ongoing until completion. This applys to areas other than roadless where eminent domain is used, which also applys to inventory work.

I want to get hard paper copies of any further EIS or inventory work on the rule revision, and adequate response time, with dates due.

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In writing in response to the proposed Indiana bat habitat reduction. The tree that was located was likely one of several used by the maternity colony. In an extensive natural forest, mortality will occur ongoing, but live canopy trees (oak, hickory, locust, elm etc) provide loose bark above 40'. The site itself is what's important for a maternity colony — the microclimate and available foods on a continuum throughout the time until young are flying. They should be proximal at first, since newborn babies need more feed and care and adults for warmth. The food insects are temperature sensitive. Timing of flight for breeding swarms is usually based on moon phase and so varys from year to year within 14 days (half-cycle) and with weather. The Indiana bats have two main groups of insects for food, (although opportunistic especially proximally) Aquatic insects and Noctuid moths. Aquatics are mostly crepuscular, flying in dawn and dusk over water in twilight. As the air cools they fly lower. After dark female moths move to canopy gaps near host trees and release pheromones to attract other moths until a swarm is formed. By then air above the canopy will have cooled and the wingbeats of the swarm will generate heat which chimneys through the gap as infrared smoke. Indiana bats don't see color (only primates do) but they see better than any other bat or mammal studied. (965 diopters as opposed to 60 diopters of night vision for humans) From personal observation, Eastern small-footed bats have close to Indianas night vision and also hunt Noctuids. Both can detect heat by seeing into infrared and ultraviolet ranges: Indianas above or in canopy, small-footed below or in understory.

Ecomorphology (form follows function) is the basis for paleontology and theory on adaptations. Form shows potential and liabilities. I first heard it applyed to birds, but when I was illustrating a key to Missouri Ozark bats in 1972 at M.U. my advisor dr. Bill Elder had me read a draft dissertation by Ulla Norberg on ecomorphology and flight performance of Eurasian bats (U of Gotemberg, Sweden) Wing shape and camber determine speed and maneuverability; big ears and tail membrane provide drag. Indiana bats are the slowest flying Myotis in the Ozarks. (other slow fliers are silver-haired, Ozark big-eared and eastern small-footed bats.) Ecomorphology also applys to prey. Noctuid moths have excellent color vision and hearing. Only four families of moths have ears Ears are only for bat detection, they don't communicate with each other.

The position of the ears on the body of the moth shows the angle of attack by the bats, and the type of bat. Geometrids (Inchworms) and Arctuids (tiger moths) have their ears lateral on their abdomen, so they are exposed on the wing upbeat and can detect bats approaching from the sides. Both fly in the open above the canopy or over fields or pastures, usually high. Fast-flying but limited maneuverability bats hunt them (tricolored, red, big brown) so moths can evade them with warning. Tiger moths go a step further — they eat toxic plants and make a clicking sound (only when they hear bats) to warn the bats.

Hawkmoths (Sphinx) fly in the open fast, straight and far. Their ears are modified mouthparts, so they're worried about bats straight ahead - the same open fliers.

Noctuid ears are on their backs (thorax) pointing backwards, to warn of bats coming behind them (Indianas, small-footed) or of blue jays while resting in daytime. Swarming in canopy gaps during maternity colony time are mostly owlet moths (genus Zale) and a few underwings (locust, false) More underwings (genus Catacala) swarm through summer and fall as young bats are flying. Pheromones are genus-specific To prevent hybridization within the swarm, wing patterns (especially hind wings) are distinct to species. Moths with different plant hosts have different digestive systems — most hybrids can't survive. Most underwings have variations of an owls' face to scare blue jays and other birds, but those that eat walnuts and hickories have solid dark (blacks, brown, gray) underwings with or without a bright white fringe below. So mating is visually driven within the swarm, while hearing warns of bats.

Once foraging Indianas detect a swarm, they go silent and drop into the canopy. They work through clutter slowly by sight and come into the gap slowly from the side and catch moths from behind — after they've seen the underwing pattern.

The female moths once bred leave through the gap and find a host tree to lay eggs. A female won't lay eggs on a tree attacked by caterpillars that year — the chemical reaction is to produce toxins that repell her. This allows that tree to recover next year.

Indianas use sight when moving (owls hear noisy bats) so they can see mist nets and fly slow enough to back out from the net. They usually stay in the canopy 40'+ above ground or higher so volleyball nets that are easy to tend won't catch them. That's why it took years to catch one, and more years before catching a lactating female to radio-track back to the colony. When research accomidates methodology, results are questionable at best.

An Oklahoma study of Ozark Big-eared bats admitted in methodology their equipment only had a range of 3 km, yet conclusions were that their foraging range was 5 km. Male Giant Silkworm moths (Saturniinae) can follow a scent trail of ♀ pheromones 5 km (same equipment ?) into wind. Forest boundarys aren't apt to be symmetrical; wind changes direction and intensity; scent carrys far or attenuates rapidly; availability isn't random. Ongoing ajustments are necessary, but manageable in natural situations.

But clearing large areas isn't natural, nor is thinning or understory removal. Clutter to you is cover to the bats. Any bird is faster than any bat, and Indianas are one of the slowest bats. In the open, screech owls, barred owls, barn owls, and even Chuck-will's-widows can easily catch bats at night, blue jays can if flying in daylight. Near or in clutter, bats can and do usually avoid capture.

Clutter to foresters is biodiversity to ecologists. A forest is more than a random assemblage; it's a dynamic symbiosis which needs all its parts. Reducing it to a monoculture or woodlot may dumb down management to comfort levels, but then who needs foresters? Anybody can fell culls, or write up contracts, or level timber. The bats also need a continuum of insect food. Phenology of available flying insects throughout the growing season should be in a reliable sequence with no gaps. In the winter, Noctuid moths' eggs, caterpillars, pupae and even a few adults are in the leaf litter. Fires eliminate food.

It would be a good idea to get a biotic inventory of the Roberts Gap project area, at least as it relates to Indiana bats food availability. Maternity colonys, swarming caves and hibernaculums all limit foraging range. A constant limit to movement is insect flight. Bat flight demands so much energy that any time a bat flys far, it has to eat. When it stops flying, the bat has to reduce its metabolic rate to a torpor to save energy. Travel between maternity trees and caves (Wolf Branch, Hasty, Horseshoe, Smith Creek, Spirits' Creek, Tom Watson, etc) should be on wide corridors to avoid bottlenecks predators can use for traps. The lactating female Indiana first caught might have been flying low to avoid an owl perched at canopy height. One summer near Deer, I watched a family of Silver-haired bats (slow fliers) come out of a cedar grove to the corner of a long and wide field.

Where the silver-haired bats got to the field corner, the pond was only a couple hundred feet of open ground away; but all summer the bats would circle the entire field edge to stay close to escape cover.

I've heard of simular bat poles other places but using untreated wood poles put in with post-hole diggers or a post auger on a farm tractor. (my dad set poles for a hay shed with a block and tackle.) Metal poles are heavier and convey heat or cold extremes, could easily draw lightning. If they aren't used by bats, wood poles can be left to rot with no harm to the site. If bats do use them, they can be easily replaced in winter with minimal disturbance.

The pole pictured is on the edge of a riparian strip or forest edge, with no vegetation between the pole and the camera. The background is tight clutter except for the canopy gap above the dead tree, which was taller than the remaining younger trees. With no remaining bark, it is of no use to the bats. The woodpecker holes at the top could [redacted] squirrels or birds but not Indiana bats. To safely get to or from the pole, bats would have to come through the clutter. In such a manicured landscape the strip of timber shown is amid an agricultural landscape and such large-diameter trees are rare or gone entirely on long stretches.

In the lower Michigan study by Kurta & Rice (2002) roost trees, the trees were all riparian species except 3 shagbark hickorys - all of them would rot quickly once dead, as most were already. That colony was in trouble, [redacted] but site fidelity might keep them in the area until younger trees grow big enough. Riparian trees are short-lived but grow fast. The likelier threat is to their food; almost all aquatics or agricultural. Murray and Kurta 2002 found aquatic insects to be a preponderance of Indiana bats diets. Were no surprise for the northern part of their range. Availability of forest habitat is linear and riparian, often broken into disjunct pieces, in an agricultural matrix so travel distances and timing are individualistic for each colony. Fidelity is not to a fixed point (tree) or area but to the foraging potential in terms of consistent availability of insects on a continuum throughout the maternity colonys' time until young are flying. Quality also matters - "preferred" foods may be obligate.

In fact I think all Myotis species in Arkansas and most other species here need some aquatic food in their diet while lactating, and opportunistically the rest of the year. When the white-nosed fungus first spread, some researchers said a symptom of it was bats flying in the daytime, but they were reported doing so in the 50s (Indiana bats in Kentucky in occasional papers of the Reading Pa library) Insect flight time is limited to daytime by temperature in winter.

Most aquatic insects have explosive populations and short flight times (mayflies classic) They require diversity to maintain a steady supply of food through lactation (most gone with spring) The exception is caddisflies (Trichopters) which fly all year except January. While the ponds provide some distinctive species, the beaver ponds on the creeks/river below will do the same. Other species need headwaters trickles and pools yet others need springs or seeps. Still others are just across highway 16 in Mulberry or Piney headwaters (eg. Neotrichia arkansasensis (type Kings River 5 mile S. Kingston also Deer Spring 1 mile E of Ozark Lepidostoma griseum Mill Creek below Dogpatch also Arkansas House spring Jasper L. ozarkense spring seep off hwy 27 8 miles S of hwy 333 — endemic, Oecetis ozarkensis type Gunner Pool Sylamore RD Pycnopsyche rossi branch of Cecil Creek - Erbie Molanna ulmerina spring 5 m W Ozark also Long Pool) Local endemics and disjunct isolates such as these are easy to overlook, but may be needed by the bats. Availability is a result of biodiversity, and proximal location. (1-2 hour flight time) to a variety of micro habitats is likely why they are where they are.

When crepuscular aquatics go down, Indiana bats shift to Noctuids. Several species have riparian host trees but most are upland. From 1998 to 2012, I drew or observed well enough to identify to species about 50 species of Catocala moths. (Newton county or adjacent townships) Only a half-dozen species of them were out in May + locust & false underwings but a dozen species of owlet moths are flying by then. Ten more Catocala are available in June, 35 in July, 50 in August, 37 in September, a few in October and November. Eastern small-footed bats also hunt Noctuids, but they fly low at high elevations (in terms of local elevations.)

Another reason for maternity roost selection is to be in a pocket of dead air space and protected from clutter from F.M. radio waves. Their own ecolocation is in low F M range and radio clutter may be manageable far enough from stations but probably interferes with sleep and rest, which has to lower metabolism. Wind itself is a major killer of young birds just off the nest. Hypothermia can happen at higher temperatures with windchill, especially with high humidity like fog or drizzle. Roost trees should be surrounded by an otherwise mostly old-growth canopy (20+' taller than secondgrowth) to break wind and lateral radio clutter. (With a narrow twisting hollow like Knuckles Creek off the narrow river headwaters, straight winds are blocked; but overhead moonlight makes prey identification easier (as in Pruitt Hollow. Unfortunately, overhead satellites beam down F.M. clutter, but bats hunt by sight so they can concentrate around it. The moths respond best on a full moon and move up to the top of the gap, but the funnel effect of the gap concentrates light to focus (as in a well or chimney to see stars in daylight.) To be effective for foraging Indianas, vegetation should be tight in most part at all levels, with gaps spread far enough apart to prevent lateral light on them.

The urge to manage through high-tech and heavy equipment contracts immediately seems to be the imperative and the bats the excuse by bad mislogic. If as is likely the bats fail to use the poles and avoid detection as they did until recently, management will arrogantly try to use the nil hypothesis; "if I can't find it, it ain't there." and proceed to destroy remaining habitats. Like the passenger pigeon or Ivorybill, Indianas require large-scale forests, [redacted] not tiny fractions of an acre around a dead tree. The roost tree is the best choice near a critical site; not a centerpiece for a heavy-equipment playground.

Opening up the area around the pond and poles only makes it easier for predators to get the bats. The collecting tray shown on the pole is too low. Easy to service and easy for a blacksnake to get around or a bear to try to climb. [redacted] Leave a light-weight ladder like for a tree stand along the bulldozer road away from the (wood) poles and set the pan up out of bear reach. Better yet, leave the hollows alone and do at least two years of competent inventory for Noctuids and Trichopterans before altering habitats in any stand

While poles are needed for riparian strips in an agricultural matrix, in a forested landscape other options are close by. Metal poles will heat up but also freeze. Touch a flagpole or car hood parked in full sun – beyond comfort. Wind-chill is worse in the open than surrounded by trees.

Pole removal would involve more disturbance. How are the metal poles held up? Probably with a concrete pad that leaches caustic lime into groundwater and itself defys removal. Add a cement truck to the equiptment list if so. If not, see how long it takes them to fall.

But the costs of removal would be more than it'd be worth, so they'd probably stay – as tombstones for the bats, and as a lasting monument to mismanagement amid a playground for heavy-equipment operators and idle crop dusters.

Archeologists in the far future will find a metal Stonehenge and wonder what kind of devil-worshipers went out of their way to destroy the natural world setting the foundations for their tower of Babel. Continuing the governments' war on God (undeclared but obvious with ongoing destruction of Creation) is one we all lose. Who started it? Not God. Who should surrender? Not God. Who should repent? Not God. Read your coins. (Luke 20-25)

When I talked briefly with Jane Goodall in 1972 we agreed that wildlife research can be a threat to many species if it involves repeated or ongoing stress to force altered behavior, or sacrifice of "specimens" for labratories or collections. Observation of natural behavior should be the first step in wildlife research, before alteration of habitat. Restraint is needed.

Single-tree selection carefully done with 90+% canopy retention and removal with draft animals and rubber-wheeled buggy or wagon or cart for firewood could be sustainable as in Europe with hardwood coppice with standards lasting many centurys. Don't get in a hurry to get it all now. Greed kills.

Indiana bats are forest bats – leave them a forest to live in.

Sincerely

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