October 26, 2024

TO:
Christopher Thornton, District Ranger, Tell City Ranger District
(b) (6)

FROM:
Sally Letsinger
(b) (6)

Project Information:

- **Project Name:** Buffalo Springs Restoration Project
- **Responsible Official:** Christopher Thornton, District Ranger, Tell City Ranger District
- **National Forest/Ranger District:** Hoosier National Forest, Tell City Ranger District

RE: Public comment regarding: Buffalo Springs Restoration Project

Comments are from my personal perspective, but informed by my years of expertise in the hydrogeology of Indiana.

> My previous comments, dated December 19, 2022, raised concerns about the potential for the Buffalo Springs Restoration Project to negatively impact water quality in the Patoka Lake watershed. The Patoka Lake Reservoir water supply, as well as water supplies associated with the sensitive ecosystem in the karst landscape in the project areas, could be endangered by this project. I specifically highlighted the risks associated with soil erosion and sedimentation, nutrient loading, and herbicide runoff.
>
> There is a significant disconnect between the Forest Service response and concerns expressed in public comments regarding the Buffalo Springs Restoration Project. While the Forest Service maintains that the project is necessary, scientifically sound, and aligned with its management goals, concerns about the justification, methodology, and potential impacts have not been allayed. I would like to revisit the concerns outlined in my 2022 comments and highlight where the USFS has been nonresponsive or the response has been inadequate and non-protective.

Comment Point (Sally Letsinger)	**Forest Service Response**	**Second Comment Summary**
Questioning the validity of using the 2006 Forest Plan for a project of this scale.	The Forest Plan guides all natural resource management activities for the Hoosier National Forest.	The 2006 Forest Plan is outdated and does not reflect current scientific understanding of forest ecosystems, climate change impacts, or public values. The Forest Service should update the plan before proceeding.

Concerns about the proximity of treatments to drinking water sources and sensitive hydrogeologic settings like karst features and springs.	The EA states that Forest Service staff will continue to complete site-specific analysis prior to implementation of project activities occurring within areas of known karst resources. Turbidity monitoring will be conducted. Silt fences will be installed, sensitive features will be buffered.	The Forest Service's reliance on "site-specific analysis" is insufficient. A comprehensive hydrogeologic study of the project area is requested to assess potential impacts on groundwater and drinking water. Projected future climate conditions that include intense winter/spring rainfall events (during leaf-off conditions) are likely to generate runoff, erosion, and sedimentation beyond that which traditional BMPs were designed. Recommend reducing the size of treatments, especially clear-cuts and road construction. Take great care with the size of prescribed burn areas.
Request for a more comprehensive hydrogeologic study.	Not explicitly addressed in the provided responses.	I reiterate the need for a dedicated hydrogeologic study, emphasizing the importance of understanding groundwater flow paths, potential contaminant transport, and long-term impacts on water resources.
Concerns with the scale of the project and the size and aggressive approach of treatments.	The proposed actions described in this document would be implemented in smaller plots, gradually over time with limited impacts to resources in any given year.	The Forest Service has not adequately addressed the cumulative impacts of the project, especially considering the project's scale and the aggressive nature of some treatments.

Outdated Forest Plan

While the US Forest Service (USFS) maintains that the 2006 Forest Plan remains valid until replaced and that individual project assessments use current science, a closer look reveals this assertion to be inadequate and misleading. The USFS acknowledges that the National Forest Management Act directs plan revisions every 15 years. Moreover, Congressional appropriations explicitly stipulate that while the Secretary of Agriculture is not in violation of this requirement solely due to exceeding the 15-year mark, this exemption is void if they are "not acting expeditiously and in good faith" to revise the plan. Given that the 2006 plan was due for revision by 2021 and is currently being used to justify the Buffalo Springs Restoration Project – the largest in the history of the Hoosier National Forest – it is clear that the USFS is not fulfilling their legal and ethical obligations to update the plan based on up-to-date ecological understanding, climate science, and public input. This approach not only undermines public trust but also risks significant harm to the very ecosystems the USFS is tasked with protecting.

Concerns Regarding the Buffalo Springs Restoration Project and the Patoka Lake Watershed

The Patoka Lake Source Water Protection Plan raises serious concerns about the potential for sedimentation and runoff to negatively impact the water quality of Patoka Lake, a vital drinking water source for thousands of people. The plan identifies several existing vulnerabilities within the watershed, including high sediment loads during storm events, a lack of adequate riparian buffers, steep slopes

prone to erosion, agricultural drainage systems that can rapidly transport contaminants, and the impacts of rapid development along the S.R. 64 corridor. These concerns highlight the importance of careful land management practices within the watershed, especially given the potential for increased sedimentation and runoff resulting from large-scale disturbances.

The proposed Buffalo Springs Restoration Project, with its plans for large-scale timber harvesting and prescribed burning within the Patoka Lake Watershed, directly intersects with the concerns outlined in the Source Water Protection Plan. While the project documentation mentions monitoring turbidity and identifying karst features, these strategies are insufficient to prevent sedimentation and water quality issues in the first place. Monitoring turbidity, while important for assessing water quality, is an after-the-fact measure that does not prevent sediment from entering the waterways. Similarly, while protecting karst features is crucial for maintaining groundwater quality, it does not address the broader issue of surface runoff and soil erosion resulting from timber harvesting and prescribed burning.

The Source Water Protection Plan's emphasis on protecting the drinking water supply and maintaining water quality provides a strong argument for modifying the Buffalo Springs Restoration Project. Scaling back the project scope by reducing the acreage for timber harvesting and prescribed burning could help minimize the potential for increased sedimentation and runoff. Exploring alternative forest management strategies, such as selective thinning and smaller-scale prescribed burns, could achieve the project goals while prioritizing water-quality protection. Furthermore, strengthening monitoring and mitigation measures, as recommended in the Source Water Protection Plan, is crucial to address the potential negative consequences of the project and ensure the long-term health of the Patoka Lake Watershed.

Sensitive karst ecosystems

The Buffalo Springs Restoration Plan must prioritize the protection of karst ecosystems and water sources, particularly springs, which are abundant and vital in this region. As I pointed out in my original public comment, the project area sits within a fragile karst landscape where surface water and groundwater are intimately connected (and not always in straightforward and predictable ways). Ignoring this connection could lead to severe consequences. The USFS-funded study on sinkhole development risk within the Hoosier National Forest underscores the sensitivity of this landscape (Letsinger and Olyphant, 2011).

The reliance on 25-foot buffers around identified sinkholes, as recommended by the USFS, demonstrates a limited understanding of karst hydrogeology. Dye tracing studies have proven that groundwater catchments in karst regions can extend far beyond surface watersheds, rendering these narrow buffers inadequate for protecting water sources. Furthermore, the reliance on incomplete well data and mapped springs to assess potential impacts is insufficient. A comprehensive inventory of springs, many of which are likely undocumented, and a detailed analysis of sinking-stream systems are necessary prerequisites to any management actions. Neglecting to conduct such thorough assessments prior to implementing the current plan could lead to irreparable damage to the karst ecosystem and jeopardize the drinking water sources of both self-supplied and municipal systems.

Scale of projects to meet USFS objectives

Maxwell and others (2024) explore the asymmetric effects of hydroclimate extremes, such as droughts, on tree growth in the eastern United States and highlight the range of sensitivities of different species to these extremes. This research emphasizes the importance of diverse species compositions and accounting for environmental factors like climate variability in forest management decisions.

Maxwell's work can be applied to the Buffalo Springs Restoration Project and other Forest Service projects in several ways, such as highlighting the limitations of a single-minded focus on oak-hickory dominance. The study suggests that maintaining a diversity of tree species is crucial for overall forest resilience to climate change, particularly drought, as different species have varying tolerances and responses to extreme events. The findings indicate that relying solely on a few drought-tolerant species might not be the best approach for long-term forest health.

This research has important implications for forest planning activities, such as emphasizing the need for adaptive management practices that consider the dynamic nature of forest ecosystems and the influence of climate change. Traditional management approaches that focus solely on timber production or a narrow range of species might need to be adjusted to account for drought vulnerability and the importance of species diversity.

The paper also suggests that increasing drought frequency and severity could negatively impact the carbon sequestration potential of forests in the eastern United States. This underscores the importance of maintaining healthy and resilient forests to mitigate climate change. Old growth forests have the greatest carbon sequestration potential, and removing successful species in large swaths with the objective of diversifying the age profile of the forest could be short-sighted.

The research advocates for integrating climate-change projections and drought-risk assessments into forest planning processes. By incorporating these considerations into management decisions, foresters can help ensure the long-term sustainability and resilience of forests. For example, it does not appear that future climate projections that anticipate more extreme precipitation and runoff events during Winter and Spring in the Ohio River Valley and southern and south-central Indiana were considered in the restoration plan (Cherkauer and others, 2023; Drum and others, 2017; Ford and others, 2021; and Hamlet and others, 2021). Most of these extreme events will occur during leaf-off season for deciduous forests, and they will most certainly be erosive events leading to sedimentation and possible slope failure on steep slopes where established trees are planned for removal.

I am advocating for a more holistic and adaptive approach to forest management that emphasizes the importance of maintaining ecological processes and diversity on multiple scales. The actions planned for this project, compared to others in Indiana, demonstrate the massive scale of the project (see the table below).

Here is a summary of the proposed or completed silvicultural actions for several project area, along with acreage or acreage estimates. The projects keep getting more expansive.

Buffalo Springs		
Silviculture	Clearcut (Pine)	698 acres
Silviculture	Shelterwood	479 acres
Silviculture	Thinning (Pine)	1,472 acres
Silviculture	Thinning (Hardwood)	1,092 acres
Silviculture	Selection	813 acres
Silviculture	Stand Improvement	292 acres
Herbicide	Herbicide Spot Treatment	771 acres
Fire	Prescribed Fire	12,135 to 15,100 acres

Silviculture	4846	acres
Herbicide	771	acres
Fire	12000-15000	acres

Houston South					
Silviculture	Clearcut (Pine)	401 acres	Silviculture	4375	acres
Silviculture	Shelterwood	703 acres	Herbicide	1970	acres
Silviculture	Thinning (Pine)	78 acres	Fire	9700-13500	acres
Silviculture	Thinning (Hardwood)	2,327 acres			
Silviculture	Selection	462 acres			
Silviculture	Midstory Removal	234 acres			
Silviculture	Crop Tree Release	170 acres			
Herbicide	Herbicide Spot Treatment	1,970 acres			
Fire	Prescribed Fire	9,700 to 13,500 acres			
German Ridge					
Silviculture	Clearcut (Pine)	355 acres	Silviculture	687	acres
Silviculture	Shelterwood	77 acres	Herbicide	0	acres
Silviculture	Thinning (Pine)	255 acres	Fire	2170	acres
Fire	Prescribed Fire	2170 acres			
Oriole					
Silviculture	Shelterwood	350 acres	Silviculture	1470	acres
Silviculture	Thinning	205 acres	Herbicide	40	acres
Silviculture	Selection	805 acres	Fire	0	acres
Silviculture	Stand Improvement	110 acres			
Herbicide	Herbicide treatments	40 acres (10-acre treatment areas)			
Uniontown North					
Silviculture	Clearcut (Pine)	631 acres	Silviculture	2347	acres
Silviculture	Shelterwood	457 acres	Herbicide	0	acres
Silviculture	Thinning (Pine)	404 acres	Fire	0	acres
Silviculture	Thinning (Hardwood)	407 acres			
Silviculture	Selection	448 acres			
Uniontown South					
Silviculture	Clearcut (Pine)	583 acres	Silviculture	2466	acres
Silviculture	Shelterwood	226 acres	Herbicide	0	acres
Silviculture	Midstory Removal	396 acres	Fire	0	acres
Silviculture	Thinning (Hardwood)	213 acres			
Silviculture	Thinning (Pine)	339 acres			
Silviculture	Selection	709 acres			

The Buffalo Springs Restoration Plan does not reference or require an inventory of sensitive geologic or hydrogeologic features, nor does it adequately outline Best Management Practices that would be effective in protecting the drinking water source for those served by the Patoka Lake Regional Water and Sewer District. Silt fences are difficult to maintain and are inadequate on steep slopes with mobile sediment, especially during intense runoff events. Turbidity and water-quality monitoring are not preventative strategies. Although they can identify sedimentation and contamination, in the absence of adequate preventative measures, as a primary suggested BMP they are alarmingly insufficient.

The USFS response to my original comments included this:

> *"The scale of the project was determined to maximize administrative efficiencies. The actual proposed treatments would be divided into smaller units. The units would then be treated individually over a number of years. The result is that only a small portion of the area would be affected at any given time. The Hoosier National Forest only conducts timber harvests on 200-300 acres per year on average."*

and

> *"Prescribed fires would occur in smaller individual units that would be separated temporally and spatially. The purpose and need of prescribed fires, as well as their impacts, are discussed in the Forest Plan as well as the EA."*

This appears to suggest that planning has been generalized in the Environmental Assessment for ease of packaging this enormous project and getting it through the onerous administrative process including what is probably viewed inside of the USFS as an annoying public comment period. The plan appears to be to figure-it-out as the USFS implements the project, which I view as not "efficient" but lazy. For example, no interstate highway construction by a contractor for the USDOT would allow vague assurances, but would require detailed site-specific plans where questions of public health and safety were involved. The fact that the plan is both designed and judged to have no significant impact by basically the same people (as far as I can tell), it is not clear to me how the public comment period is a sincere good-faith process. In any case, I submit these comments to register my ongoing concern.

Sincerely,

Sally L. Letsinger, Ph.D., LPG, GISP
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References:

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