



March 14, 2022

Via e-mail to

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**Re: Moratorium On All Land-Disturbing Activities in Candy Darter
Habitat**

Supervisor Timm:

On behalf of Sierra Club and its Virginia Chapter, I am writing to formally request that you, as Supervisor of the George Washington & Jefferson National Forests, place a moratorium on all ongoing and planned land disturbing activities in watersheds within the National Forests that contain known candy darter populations or habitat until further study can conclusively demonstrate that those activities will not harm the darter. Activities with the potential to cause harm to the candy darter include timber removal, road building, road reconstruction, skidding, prescribed burning, and any other land disturbing activities having the potential to release sediment or other pollutants to waterways. A moratorium is necessary because significant new information and circumstances relevant to the darter make clear that those activities threaten to jeopardize the survival of that deeply imperiled species in violation of the Endangered Species Act.

In support of this request, I am attaching a letter prepared by Sherman Bamford, Forest Issues Chair for the Virginia Chapter of the Sierra Club. Please contact me if you have any questions regarding the request.

Sincerely,

Benjamin A. Lockett

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Re: Moratorium On All Land-Disturbing Activities in Candy Darter Habitat

Supervisor Timm:

Recent decisions of the U.S. Court of Appeals for the Fourth Circuit make clear that agencies such as the Forest Service may not take any actions that push the endangered candy darter even a small step closer to jeopardy of extinction. Because numerous existing and planned activities on the Jefferson and George Washington National Forest would threaten to do just that, the Service must immediately place a moratorium on all such activities and conduct additional analysis to ensure the survival of the candy darter.

1. Fourth Circuit Court Decisions

On January 25, 2022, the Fourth Circuit found that the Forest Service unreasonably relied on modelling to predict minimal sedimentation impacts from the Mountain Valley Pipeline to the exclusion of real-world monitoring data showing that MVP construction had led to significantly elevated levels of suspended sediment.

On February 3, 2022, the Fourth Circuit found that the US Fish and Wildlife Service “failed to adequately evaluate the ‘environmental baseline’ and ‘cumulative effects’ for ... the Roanoke logperch and the candy darter” and “that the agency neglected to fully consider the impacts of climate change.”

In the latter decision, the Court cautioned the FWS

that when the baseline conditions or cumulative effects are already jeopardiz[ing] a species, an agency may not take action that deepens the jeopardy by causing additional harm. ... Put differently, if a species is already speeding toward the extinction cliff, an agency may not press on the gas. We urge the Fish and Wildlife Service to consider this directive carefully while reassessing impacts to the two endangered fish at issue, especially the apparently not-long-for-this-world candy darter.

2. Projects in the JNF impacting the candy darter population

Present and planned projects we are aware of in candy darter watersheds include the Ewing Mountain project (current) in Mt. Rogers National Recreation Area (Cripple Creek watershed) and portions of Insect and Disease Phase 2 project in Eastern Divide Ranger District (Dismal Creek watershed). There may be other projects, as well.

In a comprehensive manner, the Forest Service should analyze the full impact of land disturbing activities as they relate to the key issues raised below.

The Forest Service should also examine past activities to ensure that mitigation measures are being implemented and are demonstrated to be effective. The Forest Service should ensure that monitoring is being conducted and that the results of monitoring are being used to actively identify and implement effective restorative activities, where applicable. Past projects that we are aware of include the earlier Ewing Mountain project (previous, a decade or more ago, Cripple Creek watershed), Kelly Flats project (2006 and after), Olean project (2007 and after), Interior project (2008 and after), Big Mountain project (2008 and after), Johns Creek Mountain project (2009 and after), and Fork Mountain project (2015 and after) (all in Stony Creek watershed). There may be other projects, as well.

3. Endangered Species Act

The Forest Service has a clear duty to comply with the Endangered Species Act.

Section 9 of the Endangered Species Act broadly prohibits the “take” of any listed species. 16 U.S.C. § 1538(a)(1)(B). To “take” means to “harass, harm, . . . wound, [or] kill, . . . or to attempt to engage in any such conduct.” *Id.* § 1532(19).

The US Court of Appeals, 4th Circuit, No. 20-2159, pp. 11-12 stated:

Eighteen fragmented populations of candy darter remain. Many of these populations are threatened by excessive sedimentation and hybridization with the closely related variegate darter. Due largely to the increasing threat of hybridization, a 2018 Species Status Assessment Report predicted the species’ “most likely future scenario” is near-total extirpation across its current range, which ‘significantly increases the candy darter’s risk of extinction over the next 25 years.

Candy darter populations in the four Virginia watersheds that still support the candy darter (Stony Creek, Cripple Creek, Dismal Creek and Laurel Creek) are genetically distinct, isolated from one another, and are all vulnerable, because of the precariously low size of populations.

4. Sedimentation

The candy darter is highly vulnerable to excessive sedimentation

“... Sedimentation—Excessive stream sedimentation (or siltation) results from soil erosion associated with upland activities (e.g., agriculture, forestry, mining, unpaved roads, road or pipeline construction, and general urbanization) as well as activities that can destabilize stream channels themselves (e.g., dredging or channelization, construction of dams, culverts, pipeline crossings, or other instream structures) (West Virginia Department of Environmental Protection (WVDEP) 2012, p.12). Excessive sediments can cover the stream bottom and fill the interstitial spaces between bottom substrate particles (i.e., sand, gravel, and cobbles) and in severe cases also cause stream bottoms to become “embedded,” in which case substrate features including larger cobbles, rocks, and boulders are surrounded by, or buried in, sediment. This can affect fish species directly by limiting sheltering or breeding habitat and/or by causing shifts in the benthic community structure that alters the prey base (Berkman and Rabeni 1987, 291–293; Chambers and Messinger 2001, p. 50–51; Sutherland *et al.* 2002, entire; McGinley *et al.* 2013, pp. 223–226).

“Survey results and species accounts suggest the candy darter has a strong association with clear streams with rocky bottoms (Addair 1944, p. 170; Kuehne and Barbour 2015, p. 80; Jenkins and Burkhead 1993, p. 828; Chipps *et al.* 1994, p. 179; Jenkins and Kopia 1995, p. 5). This information is consistent with the species’ previously discussed life history and habitat needs, which indicate candy darters use cobbles, rocks, and boulders on the stream bottom as shelter and rely on unembedded pebble and gravel bottom substrate for egg deposition (Kuehne and Barbour 2015, p. 80; Jenkins and Kopia 1995, pp. 4–5; Leftwich *et al.* 1996, p. 6). Specific studies of candy darter habitat use indicate that candy darter presence and population “robustness” is correlated with low levels of sedimentation and stream bottom embeddedness (Chipps 1993, p. 52; Dunn and Angermeier 2016, pp. 1271–1276).”

p. 37, USF&WS, “Species Status Assessment (SSA) Report for the Candy Darter (*Etheostoma osburni*)” Sept. ‘17

5. Over-reliance on Unproven Modeling; Inadequate Surveying and Monitoring

A group of graduate and PhD students at Virginia Tech analyzed the modeling methods used to analyze the Mountain Valley Pipeline.

They found:

“Increased sedimentation causes a variety of biologically relevant issues, both at the individual and population level. The effects on the latter are well documented in the FEIS and 2020 Biological Opinion (BiOp), with sedimentation being the core culprit cited for projected short term population declines and lowered reproductive rates. However, the models used by USFS to understand the effects of sedimentation on various species were based solely on RUSLE and RUSLE2 output. The models are not based on data measured in the field, so it is likely that their results do not accurately represent the quality of stream habitat. This is problematic because declarations about

how much risk each species is at on a whole (and their individual populations) are being made with these numbers.

“Baseline TSS and turbidity data should be collected from the impacted streams to better assess risk to the local populations. There are many threatened and endangered aquatic species in the 2020 BiOp that will be impacted by increased levels of sedimentation; however we have focused on how issues with the Report could impact the candy darter (*Etheostoma osburni*) as a case study.

The U.S. Fish and Wildlife Service (USFWS) gives specific numbers for how much increased sedimentation the species are allowed to be exposed to over various lengths of time in their 2020 BiOp. However, as discussed in Section 4 these are relative to baseline numbers that are generated by RUSLE and RUSLE2, not measured at the site.

...

“...Embeddedness, a measure of how much suspended sediment has settled on the stream bottom, is not quantified by the USFS despite it being a vital metric to understand, since darters need porous gravel substrate to lay their eggs.

“These potential outcomes for darter species are mainly based on the impacts to spawning habitat and food availability. Both candy darters and Roanoke logperch need porous streambeds to lay eggs, while the macro-invertebrates they eat suffer their own population declines and are harder to locate in turbid waters. ...

“Comparing suspended sediment levels alongside population level effects (e.g. death, births, recruitment) is useful to quantify direct effects of increased sedimentation on a metapopulation. However, the majority of the analysis done by the agencies (FERC, USFWS, USFS) does not account for individual sub-lethal effects. Ignoring individual allostatic loads can make populations look more resilient than they actually are (Newcombe and Jensen, 1996). Allostasis is the ability of an organism to maintain homeostasis through environmental changes, especially how an organism can handle the additive effects of multiple concurrent environmental and social stressors. While dramatic allostatic overloads often result in measurable drops in reproduction or death, it can also manifest as sub-lethal damages that can greatly diminish a population’s resilience even while vital rates look promising (McEwan and Wingfield 2003). It is difficult to obtain these types of data, as it often involves field endocrinology and physiology techniques which are both time consuming and expensive to carry out. However, it is important to consider cumulative stressors to individuals within a population might have when declaring how at risk a particular population is.

...

“... This example demonstrates the importance of verifying and supporting modeled estimates with actual field measurements. This analysis was only performed for one location because of the difficulty of determining construction dates near crossings. While these results can’t necessarily be generalized to all waterways this analysis

clearly shows that MVP’s modeled results can be very inaccurate in at least some cases. It is unreasonable to assume that a model that has failed in the past will perform reliably in the future. It is incumbent upon MVP to use existing water quality data from construction they have already completed to improve their remaining work in the JNF and elsewhere. Implementing water quality monitoring more widely is a way to ensure that their expectations based on models are borne out in the real world.

“... we strongly urge the USFS to require an adaptive management strategy that includes pre-, during, and post- construction monitoring, contingency planning for events of higher than expected sedimentation, and a strong accountability structure to ensure accurate implementation. This is in line with best practices found in scientific literature, and widely recommended to supplement the modeling procedures used in the Report, especially in unique study areas such as JNF. “

[MVP sedimentation analysis fails to sufficiently mitigate water quality impacts within the Jefferson National Forest” Science Policy Initiative - Direct Advocacy Committee Substantive formal comment on the USFS Draft Supplemental Environmental Impact Statement Submitted November 8, 2020 , Banearter et al.]

6. Geomorphic Road Analysis and Inventory Package (GRAIP)

GRAIP and GRAIP Lite are tools used for Large Scale Assessment of Road Erosion. The Forest Service should ensure that its sedimentation and water quality monitoring and analysis (and post-project monitoring) for other projects is consistent with the best practices outlined above.

GRAIP Lite, the modeling method used for Insect and Disease Phase 2 project, appears to have some limitations on its robustness. In a presentation to the agency, Nelson, Black, Luce and Cissel compared GRAIP Lite and GRAIP:

While GRAIP Lite provides a means for quickly prioritizing small watersheds working with simple inputs, a detailed analysis requires the use of GRAIP.

Comparing GRAIP Lite and GRAIP, they observed

- GRAIP Lite uses calibration data to estimate flowpath vegetation and stream connection while GRAIP uses observation.
- GRAIP Lite uses GIS to estimate drainpoint and road segment locations, while GRAIP uses observations
- GRAIP Lite considers only road sediment contributions while GRAIP uses road surface sediment as well as fill erosion, gully and landslide risks and a full inventory

[GRAIP_Lite: A Tool for Large Scale Assessment of Road Erosion”, Nathan Nelson, Tom Black, Charlie Luce, and Richard Cissel, Boise Aquatic Sciences Lab, Rocky Mountain Research Station]

The adequacy of GRAIP Lite and real-world monitoring should be examined. In addition, the adequacy of modeling methods used for Kelly Flats, Olean, Interior, Big Mountain, Johns Creek Mountain, Fork Mountain, Ewing Mountain and other projects and use of real-world monitoring data should be examined.

In addition, the placement (location and number) of monitoring points should be examined to see if it is adequate.

7. Climate Change

The Fourth Circuit found “that [US Fish and Wildlife Service] neglected to fully consider the impacts of climate change.” (p. 7 US Court of Appeals, 4th Circuit, No. 20-2159)

Periodic low-flow conditions, flashiness, and high-water events are already a factor in the four Virginia watersheds where candy darters occur (especially Dismal Creek), and climate change may exacerbate these problems, killing or impacting candy darters.

“Low-flow conditions resulting from excessive water withdrawals, seasonal droughts, or hydrological changes brought about by human development or climate change (or a combination of these) could be a stressor to localized candy darter populations, especially smaller, isolated populations (e.g., Dismal Creek, in the Middle New Watershed (McBaine 2017, pers. comm.)). “

p. 41, USF&WS, “Species Status Assessment (SSA) Report for the Candy Darter (*Etheostoma osburni*)” Sept. ‘17

The BE/BAs for these projects did not adequately consider the impact of climate change on the candy darter in conjunction with the potential sediment production, increases in off-road vehicle access, changes in water flow and other impacts that could be caused by the land disturbing activities that are ongoing or planned.

8. Cumulative Effects

On February 3, 2022, the Fourth Circuit held that the FWS “failed to adequately evaluate the ‘environmental baseline’ and ‘cumulative effects’ for ... the Roanoke logperch and the candy darter”

The agencies cannot ignore that there are multiple past, present and planned projects in the four watersheds in Virginia where the candy darter occurs. The species is highly vulnerable, the watersheds are small, relics of larger, connected watersheds where the candy darter previously occurred. A true cumulative effects analysis should have been performed. The Forest Service should conduct a programmatic environmental impact statement to examines the baseline and cumulative impacts relevant to all National Forest activities affecting the candy darter.

9. Analysis of Projects

The projects rely on a Conservation Plan adopted over a decade before the candy darter was listed.

The Forest Service admits that

“FS has planned to follow the Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan, although the candy darter wasn’t listed at the time of its development (2004).” (Dawn Kirk conversation with Jordan Richard, FWS, Abingdon VA field office March 18, 2020)

The Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan was developed about 14 years before the candy darter was listed.

Analysis for projects in or upstream from candy darter habitat regularly asserts that there will be no adverse effects “because the conservation plan would be followed to ensure protection of aquatic resources in the project area.” But a rigorous examination of adequacy of the Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan has not been conducted. And neither the US Fish and Wildlife Service or Forest Service has examined whether additional protective measures should be added to the provisions of the conservation plan to protect populations of this highly imperiled fish species.

10. Summary

The two decisions by the US Court of Appeals, 4th Circuit are instructive. They illustrate the failure of the Forest Service and US Fish and Wildlife Service to take steps to protect an endangered species before proceeding with land disturbing activities. We ask you place a moratorium on these projects on the Forest and to protect the endangered candy darter.