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To Whom It May Concern:

I am submitting the manuscript “Biogeography of fire regimes in western US conifer forests: a trait-based approach”, coauthored with Matthew Kling, Dylan Schwilk, Morgan Varner, and Jeffrey Kane, to be considered for publication as a research paper in *Global Ecology and Biogeography*. This is an initial submission.

There has been a recent proliferation in the use of functional traits in ecology to describe variation in adaptive niche environments. However, the application of functional traits to vegetative communities has primarily occurred at small spatial scales and in manipulative experiments. In this paper we present a novel application of functional traits to understand biogeographic variation in conifer forest niches at a continental scale. Specifically, we focus on traits related to mature tree survival of forest fire. This is an issue of increasing importance as climate change drives increasing fire frequency, and the past century of forest management has created forests with increasing fuel loads and susceptibility to stand-replacing fire and potential forest type conversion.

We present the first synthesis of multiple functional traits related to conifer tree fire resistance, and develop an index of community fire resistance that can be applied to conifer stands across the western United States. The biogeographic representation of this community fire resistance, developed using species distribution models of 29 common western conifer species, provides insight into adaptive fire regimes in different regions, and how forest management to improve fire resilience may be targeted to those regions with the most fire-resistant species. In particular, we demonstrate general agreement with our index of fire resistance and independent assessments of fire frequency and fire regimes, while also identifying areas that may be more fire-sensitive than their historical fire regime would indicate, due in part to encroachment of fire-sensitive species in the absence of a century or more of fire. This fire resistance index has numerous potential applications in spatial forest planning and will provide scientists and researchers with a quantitative way to compare resilience of different species mixtures to increasing fire frequency. Our study is one of the largest-scale applications of functional trait biogeography in forests to date, and our approach may be extended to other ecosystems globally in the future.

I certify that the accompanying manuscript, and the data contained therein, has not been published and is not under consideration for publication with another journal. All co-authors have no conflicts of interest to declare and have approved the current version this manuscript for publication with *Global Ecology and Biogeography*.

Sincerely,

Dr. Jens T. Stevens

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