THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Forestry

Dear Dr. Hetherington:

Please consider our paper, "How budburst timing shapes woody plant strategies and traits" for publication as a research article in *New Phytologist*. We present the findings of a novel joint Bayesian model that show the relationships between budburst and traits in response to key phenological cues.

Climate change is impacting species phenologies—timing of life history events—reshaping communities, and altering ecosystem functioning. Increasing research suggests these changes are linked, as species that shift the most phenologically with warming appear to alter the assembly of communities and out-compete later species, either through their phenologies or growth strategies. Understanding this is critical to make accurate forecasts, but extremely challenging because of high variability in observational phenology. As a result, plant phenology has been systematically omitted from global trait frameworks that link to plant growth strategies and can help predict future community dynamics and ecosystem functioning.

What hypotheses or questions does this work address? We test how differences in phenology relate to well established relationships between plant growth strategies and traits. We combine global data from experiments on budburst phenology and commonly measured traits, with a cutting-edge Bayesian approach to model the relationship between budburst and traits in response to temperature and light cues.

How does this work advance our current understanding of plant science? We found strong evidence that plant traits and phenologies are inextricably linked to growth strategies. Using one of the most comprehensive datasets of trait syndrome available, we found earlier species exhibited acquisitive traits—such as shorter maximum heights, and denser, lower nitrogen leaves—while later-active species are taller with low nitrogen leaves.

Why is this work important and timely? These are some of the first findings to fit budburst phenology firmly within major functional trait frameworks and to tease apart the underlying mechanisms shaping phenology and traits globally—enabling us to better predict how communities may shift in their growth strategies alongside changing phenology with climate change.

All authors contributed to this work and approved this version for submission. The manuscript is 3569 words with a 146 word summary, and 4 figures. It is not under consideration elsewhere. We hope you find it suitable for publication in *New Phytologist*, and look forward to hearing from you.

Sincerely,

Deirdre Loughnan

Deirdre Loughnan
Forest & Conservation Sciences
University of British Columbia