*P10 –Leaf count diagnostics*

In addition to our primary seven models outlined above, we performed a set of diagnostic tests to determine the impact of leaf counts on arthropod biomass among host-plant species. Leaf density or leaf area are traits relevant to herbivore community composition (Barbour et al. 2015), and leaf traits may be different in invasive plants compared to co-occurring native plants (Leishman et al. 2007). At the conclusion of the primary experiment in summer 2022, we counted all leaves for all 240 trees and shrubs sampled in the project. In this diagnostic step, we found no evidence that leaf counts significantly impacted arthropod abundance, biomass, or bird treatment effects in this experiment (Appendix 1b: Leaf counting methods and data analysis).

Appendix 1b: Leaf counting methods and data analysis.

After bird bag exclusions were removed, we counted all leaves using hand clicker counters in August 2021. For Japanese barberry, we counted a single fascicle as one leaf. We assayed a total of 154,595 leaves using this method.

The number of leaves varied significantly among the ten plant species sampled in this project (GLM, Plant Species effect on leaf count, X2 =, P = ). Host-plant species identity effects on arthropods or bird exclusion treatment effects could be confounded by this variation, so we employed a series of statistical tests to evaluate this issue.

First, we observed no different in leaf counts among all ten plant species when comparing bagged (-bird) and unbagged (+bag) treatments (GLM, Plant Species effect on leaf count, X2 =, P =). Consequently, the predator exclusion experiment was not biased by intraspecific variation in leaf number or branch size.

Second, leaf count did not significantly impact the average biomass of arthropods sampled across all host plant species (GLM, leaf count effect on biomass, X2 =, P =). Therefore, within the range of branches selected in this experiment, plants with more leaves did not have more arthropod biomass available to birds.

Third, we ruled out the importance of leaf counts as an important co-variate to include in GLMM’s using an AIC based model selection approach. For a fully specified GLM with plant species, bird treatment, leaf counts and the response of total arthropod biomass, removing leaf count led to a reduction in AIC.