

**The New England Botanical Club
Graduate Student Research Award
2020 AWARD WINNER**

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**Conservation genetics of two rare alpine roses in
the White Mountains of New Hampshire**

Sibbaldia procumbens L. (creeping sibbaldia) and *Potentilla robbinsiana* Oakes ex Rydb. (dwarf cinquefoil) are rare alpine species in the Rose family that are of conservation concern in New Hampshire's White Mountains. The use of genetic techniques to estimate phylogenies and assess population genetic diversity has not been employed in the past but are needed to inform conservation strategies. *S. procumbens* has a circumboreal distribution, but disjunct populations occur in Quebec and were recently presumed extirpated in NH. I will make an initial assessment of the prospects for *S. procumbens* restoration in the White Mountains by investigating genetic relationships and diversity among extant and extirpated populations to aid in the seed-sourcing decision. Contrasted with this globally widespread species, *P. robbinsiana* is a narrow endemic confined to two areas in the White Mountains. Reported as an odd number polyploid and putative apomict, *P. robbinsiana* is presumed to be genetically uniform. I will evaluate the potential for sexual reproduction, the discovery of which would have management implications, by testing for aberrant ploidy levels, genetic diversity, and the phylogenetic relationship with its morphological sister and possible progenitor, *Potentilla hyparctica* Malte (arctic cinquefoil). I will sample small amounts of leaf tissue of *S. procumbens* and *P. hyparctica* from Canada and *P. robbinsiana* from the White Mountains, as well as subsample from the Harvard Herbaria and others. I will isolate DNA and prepare libraries for next-generation 'genome skimming,' used for both freshly collected and 'ancient' herbarium tissue to quantify genetic diversity and estimate phylogenies. Estimation of *P. robbinsiana* and *P. hyparctica* ploidy levels will be determined from nuclei isolates using flow cytometry. For the responsible restoration and management of these iconic and beloved White Mountains species, genetics must be considered.

The New England Botanical Club offers awards of up to \$3,000 to graduate students to support botanical research. The awards encourage and support botanical research on the New England flora (plants, algae, and fungi), including support for field, lab, and herbarium work, as well as travel to New England by those who would not otherwise be able to work in the region. The awards are made to the graduate student(s) submitting the best research proposal dealing with systematic botany, plant ecology, genetics, plant conservation biology, or related fields pertaining to the New England flora.