Northeast RISCC MANAGEMENT NETWORK
Regional Invasive Species & Climate Change
Research to Practice

Climate-Smart Gardening 2.0

Plants to Promote Climate Adaptation

Summary

Gardening with native plants that are suited to both current and future climates supports native wildlife[1], increases climate resilience, and reduces the risk of introducing future invasive species. Plant hardiness zones are shifting as temperatures warm (Fig. 1), and many native plants are not keeping pace[2]. Planting native species and near-native species from nearby ecologically similar regions can help them move in response to warming conditions (Fig. 2). Therefore, **gardening with native and near-native plants can support the future biodiversity and resilience of your garden and nearby ecosystems.** Here, we provide updated and expanded state lists of "climate-smart" commercially available native and near-native plants that are expected to grow in the Northeast with continued climate change.

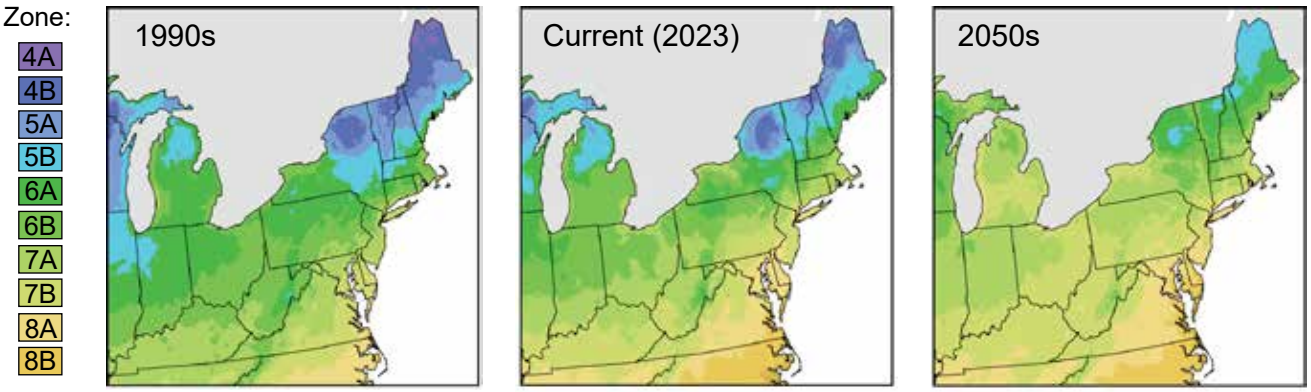
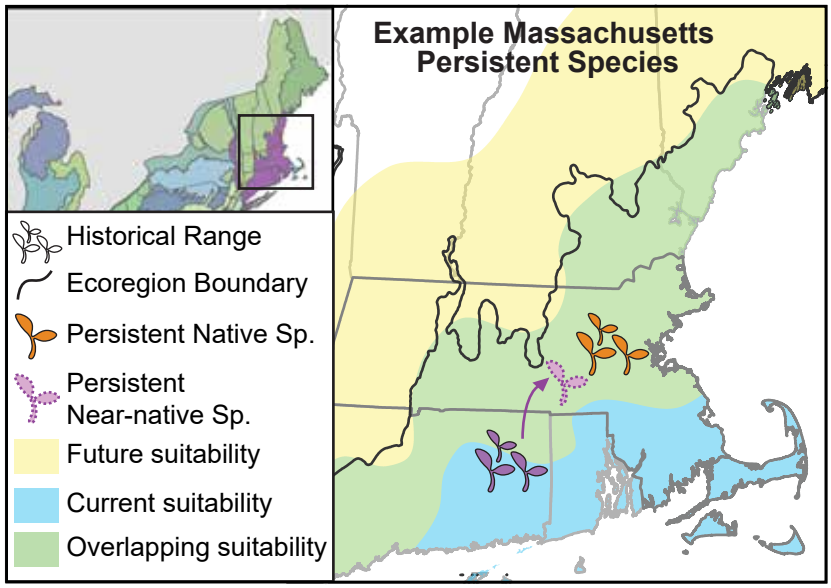


Figure 1. Plant hardiness zones (based on minimum temperatures where plants can grow) in the Northeast over time.



Definitions:

Native species: Species historically found growing without human intervention in a given state.

Near-native species: Species that are not native to a given state but are native to a nearby state with a shared Level III Ecoregion.

Persistent species: Species which are suitable for both current and future hardiness zones of a given state.

Climate-smart gardening: Planting for present and future conditions using native and near-native species adapted to both current and future hardiness zones.

Figure 2. Both persistent native and near-native species are suited for current & future climates. Unlike native species, near-native species don't have historical ranges in the focal state. Suitability represents the range of hardiness zones a species can tolerate. Ecoregions are areas of ecological similarity[3].

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Climate-Smart Ornamental State Plant Lists

We assembled a database of ~900 regionally native plant species sold by nurseries in the Northeast, including species from the Ecoregional Revegetation Application (ERA)[4]. After standardizing taxonomy[5], we added horticultural information[4,6,7,8,9] (Fig. 3) and historical native status in each state[10]. We then investigated whether each species' hardiness zones would persist in each state under likely mid-century climate conditions[11] and classified them accordingly (Fig. 4). Species that are rare or endangered within a given state were removed. Botanical, horticultural, and ecological experts also screened state lists.

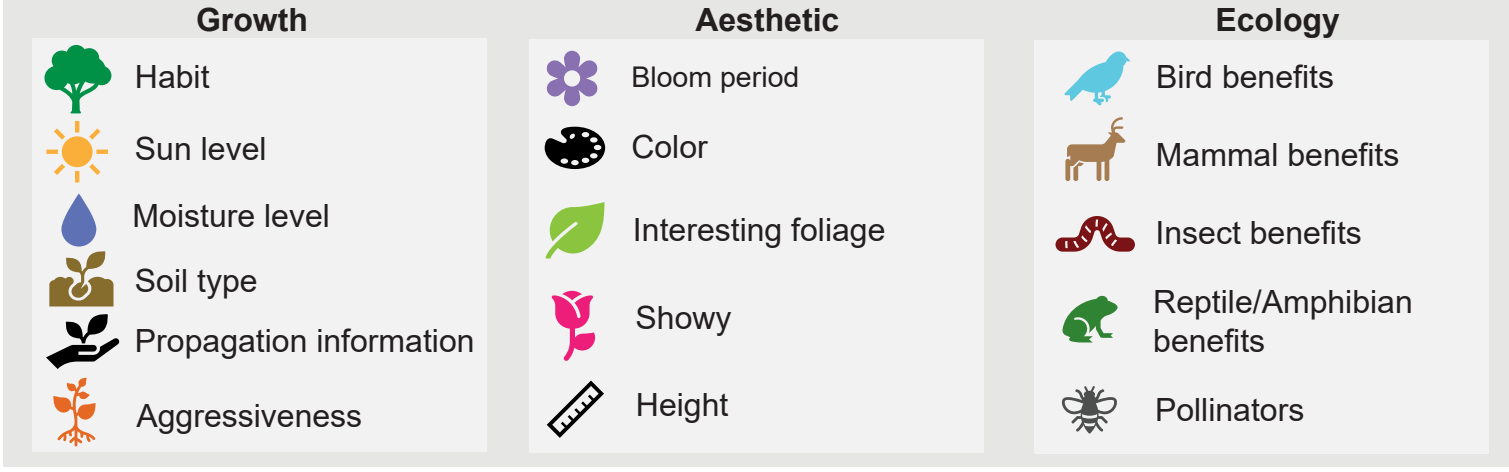

Figure 3. Horticultural and ecological information included for each plant species.

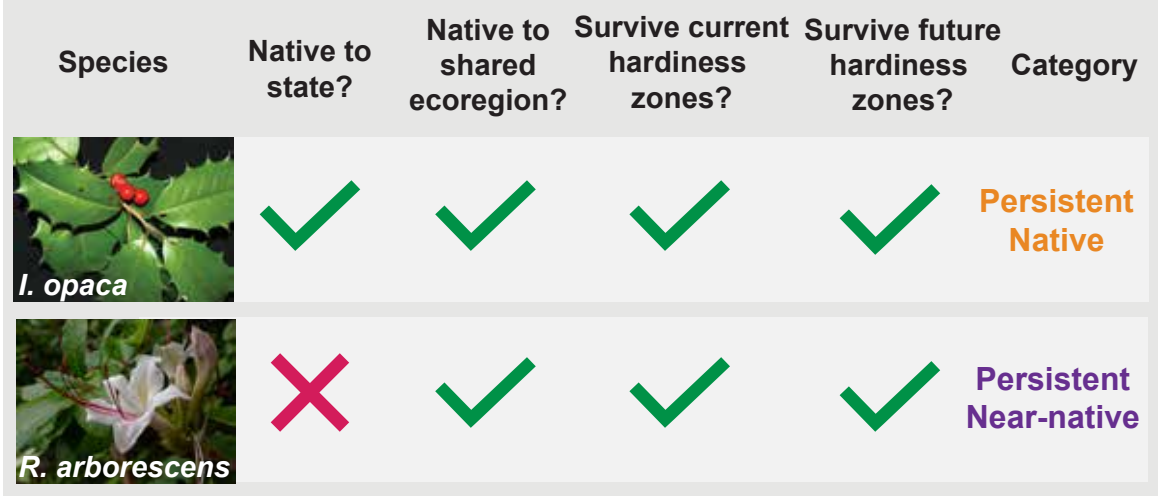

Figure 4. Example classification of climate-smart species in Massachusetts. Persistent natives and persistent near-natives already being sold in a state make good climate-smart species. Native species which are not persistent are excluded from each state list.

Proceed With Caution

Persistent near-natives aren't historically native to the focal state. These species need to move, but moving plants outside of their current range could result in unintended impacts. To minimize risk, we only included near-natives on state lists if their native range shared a Level III ecoregion with that state.

Buy native plants from reputable sources, and do not collect wild plants. Pay close attention to nursery labels and consult with state botanical societies and local/regional floras before planting subspecies, varieties, and cultivars.

Download state lists - or visit the interactive web tool: www.climatesmartnativeplants.org

References: [1]Tartaglia & Aronson 2024. Urb. Ecosyst.; [2]Bradley et al. 2024. Annu. Rev. Ecol. Evol. Syst. ; [3]Omernik 1987. Ann. Assoc. Am. Geo. ; [4]USDoT ERA: nativerevegetation.org/era; [5]WFO: worldfloraonline.org/; [6]MoBot: missouribotanicalgarden.org/plantfinder/plantfindersearch; [7]LBJ: wildflower.org/plants-main; [8]Brickell & Cathey 2004. AZ Enc. Gard. Plnts.; [9]Dirr 1998. Man. Wdy. Lndscp. Plnts.; [10]Govaerts 2023: sfto.kew.org/pub/data-repositories/WCVP [11]Matthews et al. 2018: hardinesszones.daveyinstitute.com

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