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Note

Himalayan Blackberry (*Rubus bifrons*) in eastern Canada: a timely discovery

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Abstract

Currently, the invasive Himalayan Blackberry (*Rubus bifrons* Vest) is sparsely distributed in eastern Canada and the northeastern United States, documented in Ontario, Quebec, and New England. In summer 2022, patches of this plant were found in Yarmouth, Nova Scotia, at the shrubby edges of gravel parking lots and in the town maintenance area. Of most concern is its occurrence along a former railway line that is now a trail system connecting many communities. In the fall and winter of 2022 established populations were noticed at three locations in Digby County, Nova Scotia, between 80 km and 100 km northeast of Yarmouth, where the evergreen thickets were noticeable from a distance. Climate warming and a variety of dispersal agents have likely contributed to the recent spread. Control is recommended to protect native biodiversity from this highly competitive invasive shrub.

Key words: Himalayan Blackberry; *Rubus bifrons*; invasive; dispersal; climate warming; control

Himalayan Blackberry (*Rubus bifrons* Vest; see discussion of taxonomy in Alice *et al.* 2014) is one of the world's most invasive species (Gaire *et al.* 2015). It is a naturalized scourge in southern Australia and in the Pacific Northwest because it forms 3-m tall impenetrable thickets composed of arching and tip-rooting stems that bear stout, lacerating thorns. It has been repeatedly introduced into new areas by humans because of its large crop of delicious fruit. Introduced plants have interbred to form new genetic combinations that include both sexual and mainly asexual entities (Clark *et al.* 2013). Currently, it is sparsely distributed in eastern Canada and the northeastern United States, documented in Ontario, Quebec (Brouillet *et al.* 2010; NatureServe 2023), Connecticut (Alice *et al.* 2014), Massachusetts, and Rhode Island (GoBotany 2023). Image-vouchered reports from iNaturalist (2022) reflect this distribution (Figure 1). Here we report several new occurrences of Himalayan Blackberry in southwest Nova Scotia.

In North America, Himalayan Blackberry is a cultivar derived in the 1890s in Oregon from European specimens of the microspecies *Rubus armeniacus* Focke (Clark *et al.* 2013; Griesman 2020). In Yarmouth, the most southerly location of the species in Nova Scotia (Figure 1), rooted canes from British Columbia were directly introduced to a private garden 30 years ago for fruit production (garden owner pers. comm. to N.H. 2022). In summer 2022, patches of the plant were found in Yarmouth at the shrubby edges of gravel parking lots, in the town maintenance area, and, of most concern, along a former railway line that is currently a trail system connecting many communities. At all of these sites, the blackberries grow in association with, or in close proximity to, one or more other exotic endozoochorous (dispersed by animals through ingestion) shrubs including Multiflora Rose (*Rosa multiflora* Thunberg), which has substantially increased in both rural and urban Nova Scotia over the past two decades (N.H. and S.B. pers. obs.); English Hawthorn (*Crataegus monogyna* Jacquin); and Rugosa Rose (*Rosa rugosa* Thunberg). The latter two species were noted as potential invasive problems in an assessment of eastern Canadian exotic vascular plants (Hill and Blaney 2009). The close association of the invasive blackberry with the exotic fleshy-fruited shrubs suggests that fruit-eating birds and mammals may be distributing a complex of exotic

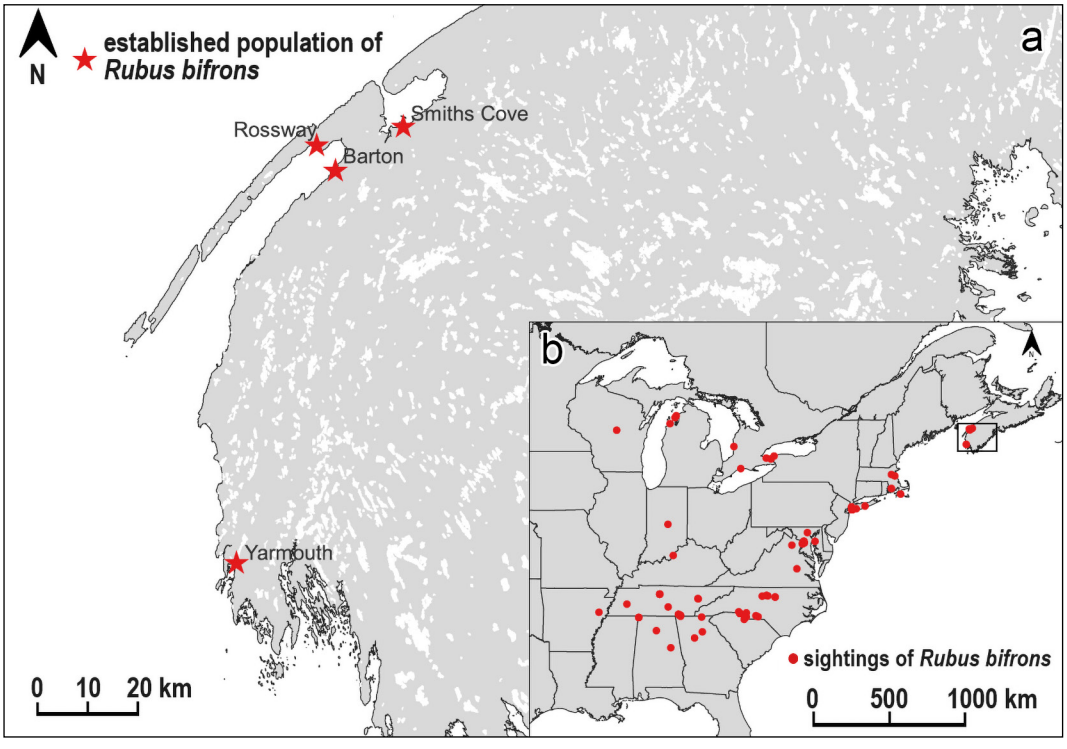

FIGURE 1. a. New Nova Scotian records for Himalayan Blackberry (*Rubus bifrons*) found over distances of 5.2 km along Highway 1 at Barton, 1.7 km along a rail trail at Smith's Cove, and 2.7 km along streets and rail trail at Yarmouth, Nova Scotia, Canada. The Rossway population consists of two patches separated by 100 m. b. Observations of Himalayan Blackberry from iNaturalist (2022) and N. Hill. Because the species is frequently misidentified on iNaturalist, mapped iNaturalist records include only author-verified "Research Grade" observations, reviewed in October 2022.

invasive shrubs. The pattern of spread of Himalayan Blackberry along the rail trail suggests that it is following the pattern of spread of Multiflora Rose; however, this hypothesis must be tested through field observation, e.g., by examining seed communities in scats.

The discovery of Himalayan Blackberry in Yarmouth was noted in the summer newsletter of the Southwest Nova Biosphere Reserve (Hill 2022). This alerted botanist Naomi Cappuccino, who found a 1.7-km long, linear population of the species along a former railway (now a rail trail) 96 km northeast of Yarmouth at Smith's Cove, Digby County, Nova Scotia in October 2022. It was then realized that evergreen thickets of Himalayan Blackberry were recognizable from the road and two other occurrences were identified in Digby County within 20 km of the first: an extensive population over 5.2 km of roadside at Barton, including some up to 86 m from the road in clearings and gardens; and a singular occurrence of two main patches 100 m apart at Rossway (Figure 1). The property owner at Rossway said that the blackberries had occupied a discrete area in the garden for ~30 years before they had started to spread in the last five years.

Himalayan Blackberry and Multiflora Rose smother lower, slower-growing vegetation and stems of both species can root at their tips when they arch over and contact the ground. Himalayan Blackberry differs from other tall, palmate-leaved *Rubus* species in Nova Scotia (e.g., Allegheny Blackberry [*Rubus allegheniensis* Porter], Canada Blackberry [*Rubus canadensis* L.], and Pennsylvania Blackberry [*Rubus pensilvanicus* Poiret]) in maximum height (>2.5 m), canes rooting at their tips, and evergreen leaves. Himalayan Blackberry retained green leaves into early February in 2023 despite a severe cold snap (–22°C on 4 February, pers. obs. D.S.). In summer, the taxon is unique among Nova Scotian species of *Rubus* in having a dense white tomentum on the abaxial leaf surfaces and, usually, pink petals.

Where Himalayan Blackberry outcompetes native shrubs along river valleys, bank stability can be reduced as native, deeper-rooted plants are replaced (Gaire *et al.* 2015). Other corridors for exotic shrub migration include roadsides and reservoir shores (Hill and Blaney 2009).

Without effective control, this new invasive spe-

cies will likely spread widely in Nova Scotia, aided by a warming winter climate (Garbary and Hill 2021). Southern Nova Scotia has the warmest winters in Atlantic Canada, and the nearby coastal region has warmed as much as 1.7°C since 1991, relative to the 1961–1990 average (Garbary and Hill 2021). Various dispersal agents, such as birds, wild mammals, and people (intentionally or otherwise by vehicles) as well as the availability of open habitat throughout the province, will contribute to rapid spread.

Mechanical removal of the thickets is possible, and their regrowth may be prevented by spot applications of herbicide (Soll 2004). We observed that landowners were in favour of eradicating the aggressive plant from their property, whereas community members valued the thickets for the abundant fruit production.

This is a timely discovery, because there is a very limited time window for effective control. Apart from its presence in urban waste areas, the plant is mostly found along roads (at Barton) and along rail trails (Yarmouth and Smith's Cove). Its evident ability to disperse along these linear corridors makes it a priority to control this spread and identify the mechanisms of dispersal (snowplows, birds, mammals, people, etc.). Failure to eradicate the invasion will result in expanded distribution and dominance of Himalayan Blackberry that could make removal virtually impossible and so limit the use of and access to recreation areas and reduce native biodiversity.

Voucher specimens

CANADA, NOVA SCOTIA: Yarmouth, on south side of Killam Shipping Building, 3-m tall canes, overgrowing a garden planting of *Rosa rugosa* and spreading throughout edges of parking lot, 43.8360°N, 66.1216°W, 25 August 2022, D. Sollows, C.W. O'Driscoll, K. Noel, P. Mills, S. Nickerson, and N. Hill, s.n. (ACAD ECS051004).

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