

NEW DISTRIBUTION RECORDS FOR FLOWERING PLANTS IN ANTIGONISH COUNTY, NOVA SCOTIA

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Distributions of over 50 species of flowering plants from Antigonish County, Nova Scotia are presented based on collections made primarily over the last ten years. Some of these are new county records representing range extensions from the western and central parts of the province. Many are new records for the eastern mainland and north shores of the province. Rare species discussed are *Asclepias incarnata*, *Comandra umbellata* and *Triosteum aurantiacum*. Several species, including *Asparagus officinalis*, *Centaurea cyanus*, *Lathyrus latifolius*, *Lysimachia nummularia*, and *Origanum vulgare*, likely represent recent or older garden escapes. *Sedum ochroleucum* is reported outside of cultivation for the first time from Nova Scotia, based on a single population that has been established for at least two years.

On décrit la répartition de plus de 50 espèces d'angiospermes dans le comté d'Antigonish (Nouvelle-Écosse), d'après des collectes effectuées essentiellement les dix dernières années. Il s'agit parfois de nouveaux cas signalés dans le comté, représentant des prolongements de l'aire de répartition depuis l'ouest et le centre de la province et, dans bien d'autres cas, de nouveaux signalements pour l'est de la péninsule et les côtes nord de la province. Les espèces rares présentées sont *Asclepias incarnata*, *Comandra umbellata* et *Triosteum aurantiacum*. Plusieurs espèces comme *Asparagus officinalis*, *Centaurea cyanus*, *Lathyrus latifolius*, *Lysimachia nummularia* et *Origanum vulgare* sont vraisemblablement des plantes échappées de cultures. *Sedum ochroleucum* est signalé pour la première fois à l'état sauvage en Nouvelle-Écosse, dans une seule population établie depuis au moins deux ans.

INTRODUCTION

Nova Scotia has a long history of floristic study (e.g., Macoun 1889) that culminated in the floras by Roland and Smith (1966, 1969) and its most recent revision by M. Zinck (Roland 1998). The extensive collections on which this flora is based are housed primarily in the E.C. Smith and Roland Herbaria (ACAD and NSAC; herbarium abbreviations follow Holmgren and Holmgren (1998)) with important additional collections also housed in the Nova Scotia Museum (NSPM). These collections provided the basic floristic and distributional information on which Roland (1998) is based. Despite this wealth of collections, the flora of several parts of the province, including Antigonish County, is incompletely known.

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Over the last ten years there has been a concerted effort to enlarge the Herbarium at St Francis Xavier University (STFX) to provide a reference collection of vascular plants for the eastern and northern mainland of Nova Scotia. Most groups are well represented in STFX, except for the Poaceae to which only a limited collecting effort has been devoted. Two extensive studies on flowering phenology were carried out in the fall of 2001 and fall and early winter of 2005-06 (Taylor & Garbary 2003, 2007). Here we report on plant collections that represent new distributions for Antigonish County or plants considered rare in Nova Scotia for which we have discovered significant populations in the County.

MATERIALS AND METHODS

Unless noted otherwise, all of the collections referred to in this paper are based on voucher specimens deposited in the Herbarium of St Francis Xavier University (STFX), in Antigonish. Most of the collections were made by two of us (DJG and BRT) since 1998, with significant additions by the other authors and our various colleagues, student assistants and research technicians.

We define rare plants as those that are numerically infrequent at some spatial scale. The Atlantic Canada Conservation Data Centre (ACCDC) maintains a list of rare plants in the province, while the Nova Scotia Department of Natural Resources (DNR) has classified most species according to the degree to which their provincial populations are at risk of extirpation, as green (secure), yellow (vulnerable) or red (threatened). Rarity is only one element determining whether a species is at risk. We used these lists, along with distributional information in Roland (1998) and older data in Pronych and Wilson (1993) to determine rarity.

RESULTS

***Abutilon theophrasti* Medik (Malvaceae)**

A single non-flowering plant was collected from a cornfield adjacent to South River in 2001. This is a minor range extension from Pictou Co.

***Allium schoenoprasum* L. (Liliaceae)**

Three records from waste ground in Antigonish Co. are likely garden escapes, but provide first observations of this species in the wild from the eastern mainland or north shore of Nova Scotia.

***Anthemis tinctoria* L. (Asteraceae)**

Several collections were made from the same population on a roadside in Antigonish during the fall of 2005. This species is widely distributed in the western part of the province, with Truro being the nearest location to Antigonish (Roland 1998).

***Aronia arbutifolia* (L.) Ell. (Rosaceae)**

Roland (1998) refers to this species as occurring primarily in the south-western part of the province and extending east to Colchester Co. There is a single collection from Antigonish Co. at Pomquet Beach Provincial Park, where *A. arbutifolia* forms part of the heath vegetation on old dunes.

***Asclepias incarnata* L. (Asclepiadaceae)**

This species has recently been collected from marshy, productive soil in the outflow of Gaspereaux Lake and in similar habitat in the East Branch St Mary's River below Lochaber Lake (Guysborough County). *A. incarnata* is uncommon in the province; ACCDC (2007) reports observations from most southern and central counties, but not Antigonish or Pictou counties. The plant appears to have narrow habitat requirements, specifically for saturated ground very near (or in) flowing water. In both populations, the plants were growing in part to full sun among lush marshland vegetation of grasses and forbs.

***Asparagus officinalis* L. (Liliaceae)**

Five collections of this widely cultivated species have been made in Antigonish County. Three are from roadsides (St Andrews, Lochaber and Antigonish), the fourth on the St FX campus, and the fifth on waste ground at Pomquet Point. These are the first records for this species from the eastern mainland or north shore of Nova Scotia. The closest previous record is from Truro (Roland 1998). *A. officinalis* grows well among roadside grass; the colony in St. Andrews has persisted for at least 8 years.

***Aster borealis* (T. & G.) Prov.**

Roland (1998) refers to this species as uncommon and shows no occurrences in the northern mainland of Nova Scotia. We have a single specimen from typical habitat for *A. borealis*: the gravelly shore of Lochaber Lake.

***Aster ciliolatus* Lindl. (Asteraceae)**

This species was originally found as part of the fall flowering survey of 2001 (Taylor & Garbary 2003) and many plants were noted during the 2005 fall phenology study. It is evidently common in Antigonish County. Roland (1998) notes its distribution in adjacent Guysborough Co.

***Bellis perennis* L. (Asteraceae)**

This species was initially reported from Nova Scotia by Macoun (1889) based on plants from the extreme southern end of the province and from North Sydney. The two plants collected on waste ground in Antigonish in 2001 (Taylor & Garbary 2003) are therefore a significant find. Return visits to the same site in 2005 and 2006 did not reveal additional plants.

***Berteroa incana* (L.) DC. (Brassicaceae)**

A single collection of this species was made in November 2005 from Antigonish. The plants occurred as a small population adjacent to a seed

and agricultural supply outlet in Antigonish. This is the only collection of the species east of the Annapolis Valley, where it can be an aggressive weed in fields (Roland 1998).

***Carex lupulina* Willd. (Cyperaceae)**

A single collection from the shore of eutrophic Lake St Joseph provides a range extension east from Pictou Co (Roland 1998) and the only record from Antigonish Co. ACCDC (2007) reports *C. lupulina* only from Colchester and Hants counties.

***Centaurea cyanus* L.**

This species is widely scattered through the province; however a single collection from a roadside in gravel and sand represents the only record from Antigonish Co or from the north shore of Nova Scotia (Roland 1998).

***Comandra umbellata* (L.) Nutt.**

This species is considered rare in Nova Scotia with a known distribution in Cape Breton and Pomquet Beach in Antigonish County. DNR classifies *C. umbellata* as a red (potentially endangered) species. Recent collections verify the Pomquet site and added Beshong Cove in Tracadie Harbour as well as Doctor Island in Caribou Provincial Park, Pictou Co. Both sites support substantial colonies of *C. umbellata*, and suggest a strong preference for coastal habitats. This species may be better considered under-collected rather than rare.

***Draba verna* L. (Brassicaceae)**

This tiny plant is abundant at two sites in Antigonish Town and County, both of which are campgrounds. The plants are conspicuous in April and May when the small white flowers and the dense inflorescences can form a haze 2-5 cm off the ground. Local plants have two leaf dimensions. The most common form has small leaves (5-8 × 2-5 mm), giving a rosette diameter of 13-17 mm. A larger and much less common form has leaves 13-18 × 4-5 mm. Our records from Antigonish provide the only collections of *D. verna* from the northern mainland of Nova Scotia.

Draba verna has been reported from other campgrounds and tourist facilities with gravel parking lots, such as Grand Pré National Historic Park (Newell 2006). This habitat reflects a near-perfect fit between the biology of the plant and human activity. These annual plants thrive on compacted, disturbed ground that is continuously maintained in this state by the nature of the land use (i.e., parking for camper-trailers). The plants flower and set seed during April and May before significant vehicular or pedestrian traffic. The seeds can then be picked up by vehicle tires or footwear and transported within hours to equivalent sites where deposited seeds may also grow well. Oldham and Zinck (1997) report a number of “campground” species of similar growth habits.

***Erucastrum gallicum* (Willd.) O.E. Schulz. (Brassicaceae)**

This species is common in Antigonish Town and County; several collections have been made from waste ground. *E. gallicum* was a conspicuous part of the late fall-flowering flora in both 2001 and 2005 (Taylor & Garbary 2003). Roland (1998) provides only two distribution points in the province: one in Kings Co and the other at Truro.

***Erythronium americanum* Ker-Gawler (Liliaceae)**

A single collection from Eigg Mountain, Antigonish, provides a slight eastward range extension from Pictou Co.

***Euphorbia helioscopia* L. (Euphorbiaceae)**

Roland (1998) reported this species to be “occasional but rarely abundant” and suggested that its prevalence was declining. In our area, *E. helioscopia* is common to abundant at many sites in the Town of Antigonish (mostly waste ground) and adjacent rural areas of the County. *E. helioscopia* was among the most conspicuous members of the late fall flora in 2001 and 2005 (Taylor & Garbary 2003).

***Hieracium X flagellare* Willd. (Asteraceae)**

This hybrid hawkweed has been found only once in Antigonish Co., at Frasers Mills. Other than a record from northern Cape Breton, this is the first collection east of Truro or from along the north shore of Nova Scotia (Roland 1998). The plant was growing in a large meadow among large populations of the parent species.

***Hieracium kalmii* L. (Asteraceae)**

Roland (1998) does not give distribution details for the mainland records of *H. kalmii* (“scattered in central parts of the province”), but notes it is most common in Cape Breton. Records from ACCDC (2007) for the subspecies *H. k. fasciculatum* and *H. k. kalmii* are all from the central part of the province as well. Four collections of *H. kalmii* from two sites in Frasers Mills provide the only records from Antigonish Co, though we have observed *H. kalmii* in a number of locations, such as along overgrown fencerows. *H. kalmii* appears to be relatively common in Antigonish County.

***Hieracium paniculatum* L. (Asteraceae)**

At least three collections of *H. paniculatum* have been made in Antigonish Co. since 2002. This species seems to be quite common on roadsides in this area. Previously, *H. paniculatum* was known only from the southern and western part of the province, with the most easterly records from Halifax Co (Roland 1998, ACCDC 2007).

***Hudsonia tomentosa* Nutt. (Cistaceae)**

This species has one of the most restricted distributions among flowering plants in Nova Scotia. It was previously known only from a few coastal sand dunes in Pictou Co (Roland 1998). In the early 1990s, *H. tomentosa*

was observed in an equivalent habitat at Pomquet Beach Provincial Park, Antigonish Co, by one of us (RL); a specimen from this population has been deposited in the Nova Scotia Museum (NSPM). The occurrence of *H. tomentosa* adds to the distinctiveness of Pomquet Beach Park, which is already home to a number of plant species with highly restricted provincial distributions, such as *Cyperus filiculmis* and *Comandra umbellata*.

***Impatiens glandulifera* Royle (Balsamiaceae)**

There are two collections of this showy garden escape from Antigonish Co. Both plants were growing on semi-shaded hillsides, in roadside ditches. One collection comes from a substantial population occupying both sides of the road. *I. glandulifera* was previously known from Brier Island eastward to Pictou Co (Roland 1998).

***Juncus conglomeratus* L. (Juncaceae)**

This is the first record of this species from the eastern mainland of Nova Scotia. It was found at Lower South River on wet ground along a river backwater.

***Lamium amplexicaule* L. (Lamiaceae)**

This species was found in Antigonish Co in 2001 as part of the phenological study of Taylor & Garbary (2003). *L. amplexicaule* was previously recorded only as far east as Truro and is considered to have an extremely local distribution (Roland 1998). The site where the plants were found has since been disturbed by soil and gravel dumping and the only known population in Antigonish Co is now extirpated.

***Lathyrus latifolius* L. (Fabaceae)**

L. latifolius is described in Roland (1998) as an occasional escape from cultivation, with records only from Kings and Shelburne Counties. Two independent populations of *L. latifolius* have been found here. Numerous plants were scattered through a flood plain of the Wrights River in Antigonish in 2006. The habitat included an old stream bed with sandy soil, and richer meadows. The plants were usually at the margins of alder or willow thickets, although some grew in the open in dense, herbaceous vegetation.

A more extensive population grows in Clydesdale, near Antigonish. For about a kilometre, *L. latifolius* is abundant in herbaceous vegetation along the roadside. The extensive populations of *L. latifolius* in Antigonish Co suggest that it has become fully naturalized; its abundance at Clydesdale suggests it has the potential to become invasive.

***Lotus corniculatus* L. (Fabaceae)**

Roland (1998) refers to this species as occurring from Yarmouth to Colchester Co. However, *L. corniculata* is common and widely distributed in Antigonish Co. It may form a conspicuous part of the wildflower community in dry old fields and roadsides.

***Luzula luzuloides* (Lam.) Dandy and Wilmott (Juncaceae)**

The single collection of this species is the first from the northern or eastern mainland of Nova Scotia (Roland 1998), although its habitat and local abundance elsewhere suggest it is probably more common. Our collection is a small, solitary plant that occurred in an open, mixed forest on wet ground.

***Lysimachia nummularia* L. (Primulaceae)**

Roland (1998) states that this species is occasional from Yarmouth to Truro and "probable" elsewhere in the province. Three collections from four sites have been made in the Town of Antigonish. The first is on the campus of St Francis Xavier University where it may represent a recent garden escape. A second small population occurred at the margins of the Town of Antigonish municipal yard. This population may have originated from one of the soil dumps that are common on the property.

The two other populations are extensive. One occurs in a meadow (as of July 2006) at the town margin where the herbaceous vegetation grows up to 1 m high. Numerous individuals of *L. nummularia* form extensive ground cover here, in several discrete patches. The final population was discovered on disturbed ground (a former gas station) where numerous plants were present among the herbaceous vegetation.

***Malva rotundifolia* L. (Malvaceae)**

Several collections have been made from a cornfield at Frasers Mills, in the interval of South River. The nearest known location based on Roland (1998) is Truro. Although considered uncommon, *M. rotundifolia* probably occurs elsewhere in Antigonish Co as an agricultural weed.

***Medicago sativa* L. (Fabaceae)**

Previously known from the western and central parts of the Province east to Colchester Co (Roland 1998), alfalfa has become widely distributed and common in Antigonish Co. It occurs in a variety of habitats from roadsides to old fields and even the sand dunes at Mahoney's Beach. Alfalfa is widely planted as a forage crop; the wild populations are probably adventive from hayfields.

***Mentha aquatica* L (Lamiaceae)**

A single collection of *M. aquatica* was made from Beaulieu, Antigonish Co, by one of us (RL) and identified by M Munro of the Nova Scotia Museums. According to Roland (1998), previous collections date from the early twentieth century, when plants were reported from Pictou and Truro.

***Myosotis arvensis* (L.) Hill (Boraginaceae)**

Several collections from Antigonish Town provide the only records for the mainland of Nova Scotia east of Truro. The plant was abundant at all sites where it was found.

***Origanum vulgare* L. (Lamiaceae)**

A few plants were found in early November on waste ground beside a newly built residence at Archibald's Point on Antigonish Harbour. The plants were no longer in flower, but had well developed fruits. Roland (1998) includes New Glasgow (Pictou Co) as part of the distribution of *O. vulgare*. Archibald's Point is very close to the original European settlement on Antigonish Harbour at Town Point, so there have been many opportunities for this species to become naturalized.

***Panicum capillare* L. (Poaceae)**

A single specimen of witch grass was collected in 2000 from a farm lane running through dense forest in an interval of South River. This is the first collection of this introduced grass in northern mainland Nova Scotia.

***Physalis heterophylla* Nees (Solanaceae)**

A single specimen of *P. heterophylla* was found in November 2005 along Brierty Brook in the Town of Antigonish. This is the first apparent record of this species east of Truro. (Roland 1998).

***Physocarpus opulifolius* (L.) Maxim (Rosaceae)**

This small shrub, commonly known as ninebark, is an escape from cultivation. Roland (1998) mentions cryptically that it has been collected "at several localities throughout the mainland." Ninebark has been collected twice here, from roadside thickets near Dunmore and beside Loch Katrine, both in the South River basin. However, *P. opulifolius* has been observed growing abundantly along roads and fence rows over a 15 km distance between and beyond the two collection sites, suggesting it may have established a naturalized population in this valley.

***Portulaca oleracea* L. (Portulacaceae)**

Roland (1998) reports that *P. oleracea* (common purslane) is a well-established agricultural weed in the Annapolis Valley, and is spreading rapidly to the rest of the province. Nevertheless, the nearest record to Antigonish County is at Truro. *P. oleracea* was collected in 2006 at an unshaded, gravel boat launch on the shore of St. Joseph Lake, along with other garden weeds. Presumably the seeds arrived on vehicle wheels. In 2007, *P. oleracea* was collected from a vegetable garden in Frasers Mills. Earlier, the plant was observed growing in a flowerbox in Antigonish and in a garden on the St FX campus. *P. oleracea* is a pioneer colonizer of bare ground and is therefore ideally suited to these habitats.

***Potamogeton obtusifolius* Mert. & Koch (Potamogetonaceae)**

This species of slender-leaved pondweed is rare in Nova Scotia, but is known from Antigonish County (ACCDC 2007). *P. obtusifolius* has been collected recently from eutrophic Lake St Joseph, where it forms a minor component of a diverse and productive community of at least five *Potamogeton* species and as many other species of submersed vascular plants.

A second collection has been made from a backwater of South River near St Andrews. Both sites are shallow, warm-water systems with high concentrations of nutrients and dissolved ions, and modest water movement. Roland (1998) mentions that *P. obtusifolius* may hybridize with closely related *P. pusillus*. Specimens of this hybrid have been collected twice from Antigonish Co, from Lochaber Lake and South River. The presence of both parent species (*P. pusillus* is common here) evidently promotes hybridization.

***Potentilla canadensis* L. (Rosaceae)**

Although this species is reported from both the mainland of Nova Scotia and Cape Breton, Roland (1998) does not list any sites from counties along the north shore of Nova Scotia. The single collection from 2001 (Taylor & Garbary 2003) was from waste ground in the Town of Antigonish. This site has now been disturbed for housing construction. There have been no subsequent collections.

***Rhamnus frangula* L. (Rhamnaceae)**

European alder-buckthorn was previously found in pastures and roadsides near towns in the south and central parts of the province. The nearest record in Roland (1998) is from Truro, and there is a single collection in ACAD from East Branch River St. John, Pictou County (under the old name *Frangula alnus*). *R. frangula* has been collected several times from similar habitat in Antigonish County. The species is well established as trees of considerable size (up to 5 m) in a low-lying area of second-growth forest on the St. FX campus. The forest appears to be overgrowing an old homestead. Another specimen was taken from wet forest along the edge of disturbed marshland elsewhere in the Town of Antigonish, a third in young deciduous forest near Upper South River.

***Rorippa nasturtium-aquaticum* (L.) Hayek and *R. sylvestris* (L.) Besser (Brassicaceae)**

These two species of cress may be abundant in slow-moving rivers (*R. nasturtium-aquaticum*) or open land (*R. sylvestris*), but previously the nearest collections were from Truro and Pictou County (Roland 1998). *R. nasturtium-aquaticum* has been collected from two sites in Antigonish County, at Ashdale (farm swale) and Frasers Mills (South River). *R. sylvestris* has been collected once along the bank of Brierly Brook in the Town of Antigonish.

***Schoenoplectus pungens* Vahl. (Cyperaceae)**

The status of this species (common threesquare) in the province is unsettled. Roland (1998) notes only a single collection of *S. pungens* (as *Scirpus pungens*) in Nova Scotia, from Shelburne County, but the Flora of North America (<http://hwa.huh.harvard.edu/FNA>) includes Nova Scotia in the range for the species. Closely related *S. americanus* is known from Yarmouth and Digby Counties (ACCDC 2007). A single collection of *S. pungens* was made from a ditch draining a soccer pitch on the St. FX campus

in 2004. As the soccer field had been constructed only a few years earlier, one wonders if *S. pungens* seed was imported with topsoil or grass seed for the field. The ditch has since infilled naturally and other species have replaced the clump of *S. pungens*.

***Sedum ochroleucum* Chaix (Crassulaceae)**

This is the first report of this species in Nova Scotia. It occurred as a number of plants extending over at least several square metres at the margin of the municipal yard for the Town of Antigonish. The plants were growing in full sun on a poor, gravelly soil along with other herbaceous plants. Given the highly intertwining rhizome and dense cover, the number of individual plants at the site cannot be determined. However, the population had about 100 conspicuous inflorescences that reached about 15 cm in height. This population was first noted in the fall of 2005, but no plants were collected then. A formal collection was made in 2006 and the population persisted through the summer of 2007.

Among *Sedum* spp. reported previously for Nova Scotia, *S. ochroleucum* (European stonecrop) is closest to *S. acre* L.; however, the flowering shoots and larger leaves of *S. ochroleucum* are diagnostic. The latter species has rhizomes without leaves, and vegetative shoots with slightly flattened, apiculate leaves, 7-9 mm long. About 12, tightly clustered, bright-yellow flowers, 1 cm in diameter, form at the apex of special shoots on which the leaves are fewer and less pigmented. The local population has flowers with up to eight sepals and petals.

S. ochroleucum has been previously noted from Maine, Massachusetts and Vermont in New England. There are no records from eastern Canada. *S. ochroleucum* can tolerate to hardiness Zone 5 and thus may persist if the site is not destroyed by human activity. This fate is quite likely because soil and gravel are routinely dumped at the municipal yard.

The United States Department of Agriculture includes *S. ochroleucum* in their list of invasive and noxious weeds (<http://plants.usda.gov>). *S. ochroleucum* seems unlikely to become invasive in Nova Scotia, however because appropriate habitat is rare. Moreover, the species propagates vegetatively rather than by seeds, which would further inhibit it spreading to new sites.

***Sinapis alba* L. (Brassicaceae)**

According to Roland (1998), white mustard has been recorded only from Kings Co. It has been found in the late-flowering studies of both 2001 and 2005 (Taylor & Garbary 2003) in and around the Town of Antigonish. *S. alba* tends to occur on highly disturbed ground where there is little competition.

***Solidago caesia* L. (Asteraceae)**

Roland (1998) points out that there are no recent collections of *S. caesia* and suggests that earlier records may be in error. Nevertheless, it has been reported "throughout north-central regions" which probably does not

include Antigonish Co. There is a single collection in STFX from Frasers Mills, where it was growing along an old logging road, and we have observed the species occasionally in similar habitat.

***Thymus serpyllum* L. (Lamiaceae)**

A single collection was made in 2001 from a neglected flower box on Main Street in Antigonish (Taylor & Garbary 2003). Other collections range south and west from Pictou Co (Roland 1998), so wild thyme is not unexpected here.

***Trifolium arvense* L. (Fabaceae)**

Rabbitfoot clover was previously reported from Kings to Pictou Counties; Roland (1998), points out that it is often confluent along roadsides. *T. arvense* grows on the gravel shoulders of all the major highways in Antigonish County; collections have been made from Highway 104 (TransCanada Highway) at Lower South River and at Havre Bouchie, and from Highway 316 at Frasers Mills (and again in Guysborough Co., where it grows in pure stands for considerable distances). A further collection was made from the shoulder of a gravel road (West Ohio) and another from mixed herbaceous vegetation growing on an abandoned bridge. *T. arvense* has recently been observed on an overgrown gravel driveway and along a walkway on the St. FX campus. This species appears to be spreading quickly.

In a manner similar to that for *Draba verna* in campgrounds, road construction has apparently selected for, and facilitated, a species which is ideally suited to that habitat. Specimens of *T. arvense* from road shoulders may be dwarfed (Roland 1998) and have comparatively long tap roots, presumably as an adaptation to the dry gravel. Nevertheless, the plant is able to establish large populations in the absence of shade or competition. Although roadsides are only 1-2 m wide, they are continuous and intersecting over the entire Province, providing *T. arvense* unrestricted access to all the habitat without barriers between patches. Automobile tires provide a ready means of seed transport to uncolonized areas, while periodic highway maintenance prevents competing species from colonizing.

***Triosteum aurantiacum* Bickn. (Caprifoliaceae)**

This species is considered rare in Nova Scotia (ACDC 2007), and is classified as yellow (vulnerable) in the DNR ranking. Although it has been previously reported from Antigonish Co (Roland et al. 1994), we include it here because *T. aurantiacum* appears to be widespread in suitable habitat within the county. Collections have been made from flood-plain forest along the South River at St Andrews and at Frasers Mills, and near the mouth of Pomquet River, the adjacent drainage. More recent observations reveal a scattered, but more or less continuous, metapopulation along the lower reaches of South River, over a distance of about 10 km. Similar, though smaller, populations extend along the lower reaches of the Pomquet and West rivers.

The species occurs in clumps within early successional forest growing on rich alluvial soil. *T. aurantiacum* appears to make its best growth in clearings. Interestingly, a thorough search of the flood plain of upper South River, above the Frasers Mills Fish Hatchery, did not reveal any specimens of *T. aurantiacum*, apparently because the species is unsuited to mature forest there. Conversely, we have recently observed a disjunct clump of *T. aurantiacum* growing in an overgrown fencerow beside an orchard, ~0.5 km from South River. Clearing of woody undergrowth along the fence, combined with lime applications around the orchard trees (which also attract frugivorous birds), may have facilitated colonization of this species outside its usual habitat. A detailed study of the population distribution of *T. aurantiacum* in Antigonish County is in preparation.

***Utricularia purpurea* Walt. (Lentibulariaceae)**

A single collection of this species in Antigonish Co was made from Taylor Lake, northwest of Lochaber Lake, in 1982. Taylor Lake lies in the West River drainage basin. Roland (1998) included eastern Guysborough Co as part of the distribution for *U. purpurea*, so its occurrence in the western part of Antigonish Co was to be expected.

***Verbena hastata* L. (Verbenaceae)**

Blue vervain is widespread but uncommon in Nova Scotia, becoming most frequent in the counties surrounding the northern Bay of Fundy (Roland 1998, ACCDC 2007). Until 2000, the nearest collection was from Pictou County. *V. hastata* has been collected from three sites on South River (at Frasers Mills, St Andrews, and Lower South River), and from Brierly Brook in downtown Antigonish. The species has been observed in the flood plain of Pomquet River and probably occurs in similar habitat elsewhere.

V. hastata appears to have strict habitat requirements. It is almost always found within a few metres of the river channel, growing either on gravel bars and eyots within the channel, where competition is limited, or less abundantly along the bank among other streamside vegetation. As with *Triosteum aurantiacum*, there appears to be a metapopulation of *V. hastata* scattered in suitable habitat all along the lower reaches of South River, from Frasers Mills to the Antigonish Estuary. Because its preferred habitat is ephemeral, the species does not persist in the same location for many years. Further collecting effort to establish the presence and extent of *V. hastata* populations in other local rivers would be worthwhile.

***Veronica arvensis* L. and *V. longifolia* L. (Scrophulariaceae)**

Roland (1998) cites both these species as occurring from Yarmouth to Pictou Counties. Several collections of *V. arvensis* have been made in Antigonish Co, from lawns and old pasture around Frasers Mills. *V. longifolia* (Garden Speedwell) is an escape from cultivation that persists along roadsides and in thickets (Roland 1998). In Antigonish County, *V. longifolia* was part of the late-blooming flora in 2005. Other specimens have been found along Brierly Brook, within the Town, in July 2006.

***Vicia sepium* L. (Fabaceae)**

Two collections of this old-field species have been made in Antigonish, one as a roadside weed, the other in herbaceous vegetation at the margin of a field. *V. sepium* has a western and central distribution in the province, and is collected only occasionally. The nearest previous record, of only four reported in Roland (1998), was from Pictou Co.

DISCUSSION

The list of flowering plants with new records from Antigonish County totals 54 species. Based on the ranges given in Roland (1998) and the STFX collection, it is estimated that about 700 of the approximately 1500 species of vascular plants known from Nova Scotia (Roland 1998) occur in Antigonish County. These additions therefore constitute an increase of about 7% in the floral diversity of the county, a surprising percentage given the small size of the area and the long history of floral studies in Nova Scotia.

As part of a continuing phenological study, two of us (DJG and BRT) have made systematic observations on the distribution of flowering plants in and around Antigonish Town in the late fall and early winter of 2001 and 2005-2006. This effort revealed 15 of the 54 new species records for Antigonish County. The remaining records arose largely from summertime surveys of particular habitats (e.g., Eigg Mountain – James River Protected Area) or casual collecting in the course of other field work.

A regional flora can never be exhaustive; there will always be new occurrences no matter how thorough the previous collection effort. In addition, the local and regional distributions of species are not static. How much of the augmentation of the flora of Antigonish County can be attributed to under-collecting and how much to range expansions? The answer probably depends upon the ecology of each species.

Weedy species, those adapted to rapid growth on disturbed ground where competition is low, are more likely to be expanding their range in the province than long-lived species of forest and glade. Agricultural weeds in particular are typically introduced as seed contaminants in grain. These species are most likely to establish in the Annapolis Valley or the central part of the province where extensive agriculture creates habitat. Species such as *Abutilon theophrasti* and *Portulaca oleracea* are probably recent migrants to northern Nova Scotia; the discovery of *P. oleracea* on a gravel boat launch strongly supports vehicle traffic as a vector. A similar argument may be applied to *Berteroa incana* (found beside a farm supply store), *Lotus corniculatus*, *Malva rotundifolia*, *Rorippa sylvestris* and *Sinapis alba*. Still, the list of probably recent arrivals to the area is comparatively brief.

An important sub-class within the group of recent migrants are those species capable of thriving on compacted, gravelly soil with frequent physical disturbance but little competition. *Draba verna*, a campground species, and *Trifolium arvense*, spreading rapidly along highway shoulders, are the most prominent local members of this group. Both species presumably

take advantage of vehicle traffic for dispersal; this agent is particularly felicitous for *D. verna*, which would otherwise have difficulty reaching widely separated patches of habitat. Roadsides present similar physical habitat as campgrounds, except perhaps for the presence of de-icing salt. It is worth investigating whether *T. arvense* has unusual salt tolerance.

Most of the remaining species reported here have probably been overlooked. This is almost certainly true of meadow and woodland plants such as the two *Aster* species, *Hieracium* spp., *Solidago caesia* and *Utricularia purpurea*. Rare species, by definition, are easily overlooked. The populations of *Verbena hastata* and *Triosteum aurantiacum* are conspicuous over a wide area within their restricted habitats of river intervals. We have no way of knowing, however, if those populations have historically been so extensive or if they have recently expanded. The lower South River is rebuilding its naturally meandering channel after historical channelization. This process has created a succession of large sand bars and gravelly islands which are habitat for *V. hastata*.

Escapes from cultivation represent a third class of species within our list of new records. Most of these are escapes from ornamental gardens, while others (*Allium schoenoprasum*, *Asparagus officinalis*, *Medicago sativa*) are agricultural escapes. Some of these species may have only recently established here (e.g., *Lathyrus latifolius*, *Sedum ochroleucum*) and therefore were not noted earlier. Others, especially woody species such as *Rhamnus frangula*, must have been established for some years, and would appear to have been overlooked. The recent addition of *Euonymus europaeus* L. (spindle tree) to the flora of Nova Scotia (Garbary & Deveau 2007) suggests that other flowering plants will be revealed growing in Antigonish County.

Our collecting efforts, especially the late-flowering studies (Taylor & Garbary 2003, 2007) have been highly biased toward disturbed ground; conventional botanical collections are probably biased toward natural habitats. This unequal effort may largely explain why so many of the new species on our list are weeds or other early successional species. These species are also more likely to be spreading rapidly. In urban areas, native and established pioneer species on broken ground may be augmented by seeds introduced in turf, fill or grass seed. Gardening and landscaping in urban areas appear to be powerful mechanisms of plant dispersal and therefore of botanical homogenization at a provincial scale.

Aside from disturbed ground, the richest sources of new species were river intervals and lakeshores. While unequal sampling effort is again a factor, it is apparent that alluvial soils in river flood plains represent special habitats of high plant diversity compared with the mixed forests and clearcuts that occupy the uplands. The lower South River alone supports at least six species of provincially rare species, several of them with substantial populations. These habitats are therefore deserving of both more concerted sampling and vigorous conservation.

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