Early detection of alien plants in xeric *Natura 2000* sites in Southern Belgium

Arnaud Monty,
Gwenn Frisson, Grégory Mahy
Biodiversity and Landscape Unit, Gembloux Agro-Bio Tech, University of Liège, Gembloux, B-5030, Belgium.

Contact arnaud.monty@ulg.ac.be
UNIVERSITY OF LIEGE – GEMBLOUX AGRO-BIO TECH – BIODIVERSITY AND LANDSCAPE UNIT

Invasion in the Natura 2000 network ?

The Natura 2000 network consists of sites designated by the member States of the European Union, under the Habitats and Birds Directives. Setting up that network is one of the biggest challenge in nature conservation in Europe, since habitats and species for which Natura 2000 sites are designated must be maintained in a "*favorable conservation status*". Little is known so far, however, about how Natura 2000 sites are invaded by exotics species.

Xeric habitats of high biological value included in the Natura 2000 network are among the most species-rich in Southern Belgium. They include calcareous grasslands, sandy meadows, dry heathlands, boxwood stands, siliceous rocks and calcareous rocks (Fig. 2.).

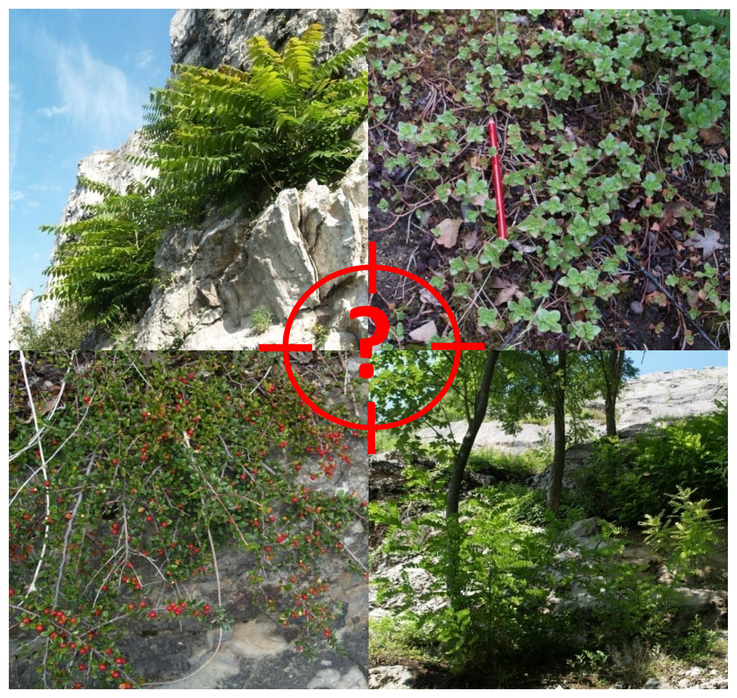

Fig. 1. Our question: which alien plant species invade xeric habitats in the Natura 2000 network in Southern Belgium, and what is the invasion stage?

Method

We randomly sampled 15% of sites in each of these six categories (with a minimum of five sites per category) , with a total of 86 sites out of 470 existing sites (Fig. 3). In each site, we recorded the presence/absence of 63 alien plants know to develop in xeric habitats (species list based on Verloove (2006) and expert's personnal observations.), and estimated species cover.

Fig. 2. Some cases of invasion: (A) *Laburnum anagyroides* on calcareous rocks; (B) *Sedum spurium* on a sandy meadow; (C) *Prunus serotina* on a sandy meadow; and (D) *Robinia pseudoacacia* on calcareous rocks.

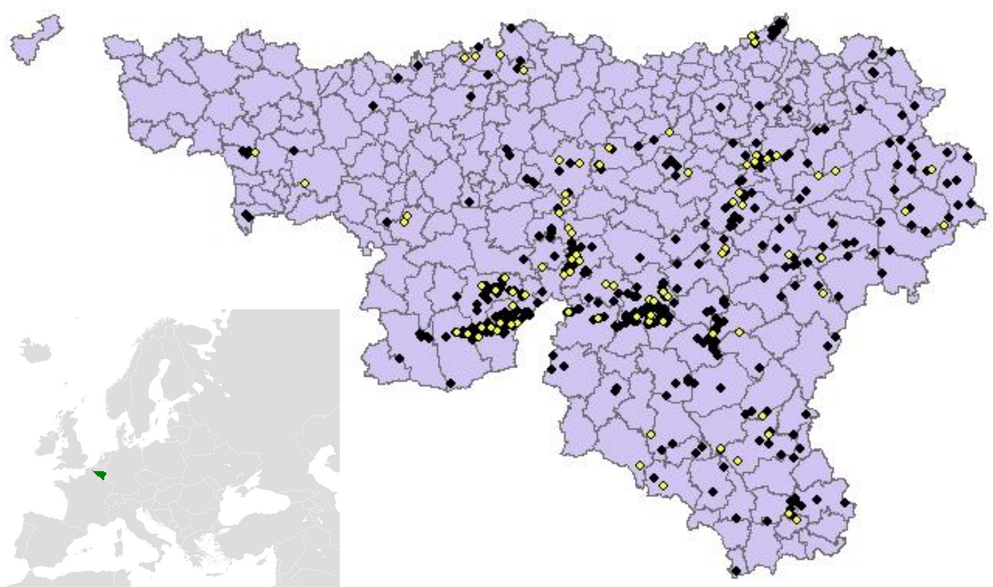

Fig. 3. Xeric sites in the Natura 2000 network in Southern Belgium. Yellow dots are sampled sites.

Results

Twenty-five species were observed in xeric Natura 2000 sites. Globally, the most frequent species were *Juglans regia* (15.1 % of all sites), *Cotoneaster horizontalis* (14.0%), *Prunus serotina* (10.5%), *Robinia pseudoacacia* (8.1%), *Buddleja davidii* (7.0%), *Hieracium bauhinii* (7.0%), *Quercus rubra* (5.8%) and *Senecio inaequidens* (5.8%). Species frequency in each habitat type is presented in Table 1. Globally, alien species showed low cover at the scale of the site (<5% of total area).

Our results indicate that a large panel of alien species are present in xeric Natura 2000 sites in Southern Belgium, but populations are still very limited. Early detection, coupled with further research, should help authorities to allocate financial resources to eradicate the most problematic species at early stages of invasion.

	Sandy meadows (n=7)	Dry heathlands (n=21)	uxus and Juniperus stands (n=5)	Calcareous grasslands (n=39)	Siliceous rocks (n=7)	Calcareous rocks (n=14)	All habitats pooled (n = 84)
Forte occurrence Abondance moyenne	*Prunus serotina (28.6%) **				*Hieracium bauhinii (42.9%)*		*Robinia pseudoacacia (8.1%) **
High occurrence (15 to 50% of sites) Low local abundance (< 5% cover)	*Oenothera deflexa (28.6%) Quercus rubra (28.6%) * Robinia pseudoacacia (28.6%) **		*Juglans regia (20%)*	*Cotoneaster horizontalis (20.5%) Juglans regia (20.5%) **			*Juglans regia (15.1%) **
Moderate occurrence (5 to 15% of sites) Moderate local abundance (> 5% cover)	*Buddleja davidii (14.3%) * Campylopus introflexus (14.3%)*	*Prunus serotina (9.5%) * Juncus tenuis (9.5%)*		*Prunus serotina (10.3%) * Buddleja davidii (5.1%) Erigeron annuus (5.1%) Hiacium bauhinii (5.1%)*	*Campylopus introflexus (14.3%)*	*Buddleja davidii (14.3%) * Robinia pseudoacacia (7.1%) **	*Prunus serotina (10.5%) * Buddleja davidii (7.0%) * Hieracium bauhinii (7.0%)*
Moderate occurrence (5 to 15% of sites) Low local abundance (< 5% cover)	*Sedum spurium (14.3%) Cerastium tomentosum (14.3%) Hieracium bauhinii (14.3%) Senecio inaequidens (14.3%)*	*Epilobium ciliatum (14.3%)*		*Cerastium tomentosum (5.1%) Quercus rubra (5.1%) Rhus typhina (2.6%) * Solidago gigantea (2.6%) Senecio inaequidens (7.7%) Oenothera glazioviana (2.6%) Oenothera deflexa (2.6%) Robinia pseudoacacia (2.6%) * Laburnum anagyroides (2.6%) **	*Amelanchier lamarckii (14.3%) Cotoneaster horizontalis (14.3%) Oenothera deflexa (14.3%) Prunus serotina (14.3%)*	*Cotoneaster horizontalis (14.3%) Juglans regia (7.1%) Laburnum anagyroides (7.1%) * Syringa vulgaris (7.1%) **	*Quercus rubra (5.8%) * Cotoneaster horizontalis (14%) Senecio inaeequidens (5.8%)*
Low occurrence (<5% of sites) Moderate local abundance (> 5% cover)		*Sedum spurium (4.8%)*					*Campylopus introflexus (2.3%) Sedum spurium (2.3%) Erigeron annuus (2.3%)*
Low occurrence (<5% of sites) Low local abundance (< 5% cover)		*Rhododendron ponticum (4.8%) Quercus rubra (4.8%) * Robinia pseudoacacia (4.8%)*					*Amelanchier lamarkii (1.2%) Fallopia japonica (1.2%) Ficus carica (1.2%) Rhododendron ponticum (1.2%) Oenothera deflexa (4.7%) Cerastium tomentosum (3.5%) Epilobium ciliatum (3.5%) Syringa vulgaris (3.5%) Laburnum anagyroides (2.3%) * Oenothera glazioviana (1.2%) Rhus typhina (1.2%) * Solidago gigantea (1.2%) Spiraea douglasii (1.2%) Juncus tenuis (2.3%)*

Table 1. Species frequency (proportion of sites where the species was observed) in the different xeric habitats.

Take-home messages

- 25 naturalized alien plant species were observed in xeric habitats of the Natura 2000 network in Southern Belgium
- Generally, alien species populations were still limited