

Finnish national pollinator monitoring scheme

A national pollinator monitoring scheme was launched in Finland in summer 2002. It focuses on the most important pollinator groups, bumblebees, solitary bees, hoverflies and butterflies following the proposal for an EU pollinator monitoring scheme (Potts et al. 2021) and the Finnish National Pollinator Strategy (2022).

Scheme design

During the first year, pollinators were sampled in 134 sites around the country (Fig. 1). The study sites represented the main habitat types for pollinators in Finland: semi-natural grasslands (28 sites), commercial forests (20), protected forests (16), forest road verges (20), agricultural field margins (40) and alpine fells (10).

Two 250 meter transect routes and four standard pan traps with blue, white and yellow bowls were placed in each site (Fig. 2), with some exceptions. Transect counts were made four times and the pan traps were emptied three times during the two-month sampling period in June and July.

First year's results

Both monitoring methods revealed a large material. A total of 8192 butterflies of 66 species and 4207 bumblebees of 29 species were observed in the transects. Pan traps attracted 5172 bumblebees of 29 species, 3391 solitary bees of 105 species and 2661 hoverflies of 149 species. In total the sampling covered a substantial proportion of the species of the focal pollinator groups occurring in Finland: 55% of butterfly, 78% of bumblebee, 51% of solitary bee and 43% of hoverfly species recorded in Finland. The sampling produced novel data on both the geographic distribution and the occurrence of pollinator species in different kind of habitats (summarized in Table 1 and Fig. 3).

The results of the first year of monitoring are promising and provide important knowledge on the current state of pollinators in Finland. The new scheme improves the coverage of pollinator groups compared to other existing insect monitoring schemes in Finland by including small pollinators that are difficult to identify in citizen science - based monitoring. In the future, the aim is to produce quantitative data on the yearly fluctuations, long-term trends and habitat requirements of many previously poorly studied taxa.

Funding and participating organizations

The scheme is funded by the Finnish Ministry of Environment (via PÖLYSEURA-project 2022-2024) and coordinated by the Finnish Environment Institute. Finnish Museum of Natural History is responsible for the identification of the insects in pan traps. Other collaborators include Metsähallitus (Parks & Wildlife Finland), Natural Resources Institute Finland, 4H youth organization and the Lepidopterological Society of Finland.

References

- Potts, S.G. et al. 2021: Proposal for an EU Pollinator Monitoring Scheme, EUR 30416 EN, Publications Office of the European Union, Ispra.
- Ympäristöministeriö 2022: Kansallinen pölyttäjät strategia ja toimenpidesuunnitelma. Ympäristöministeriön julkaisuja 2022: 9.

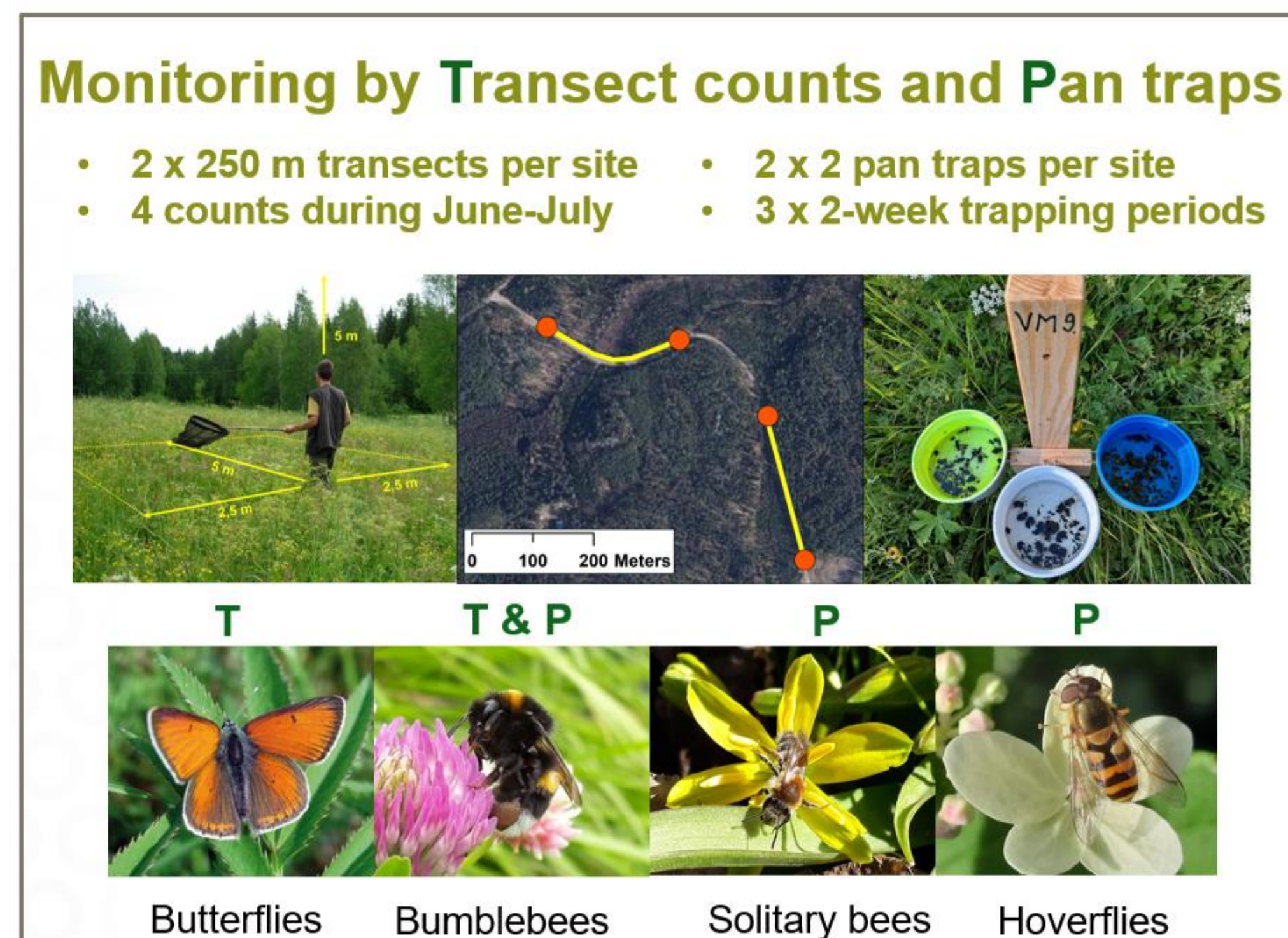
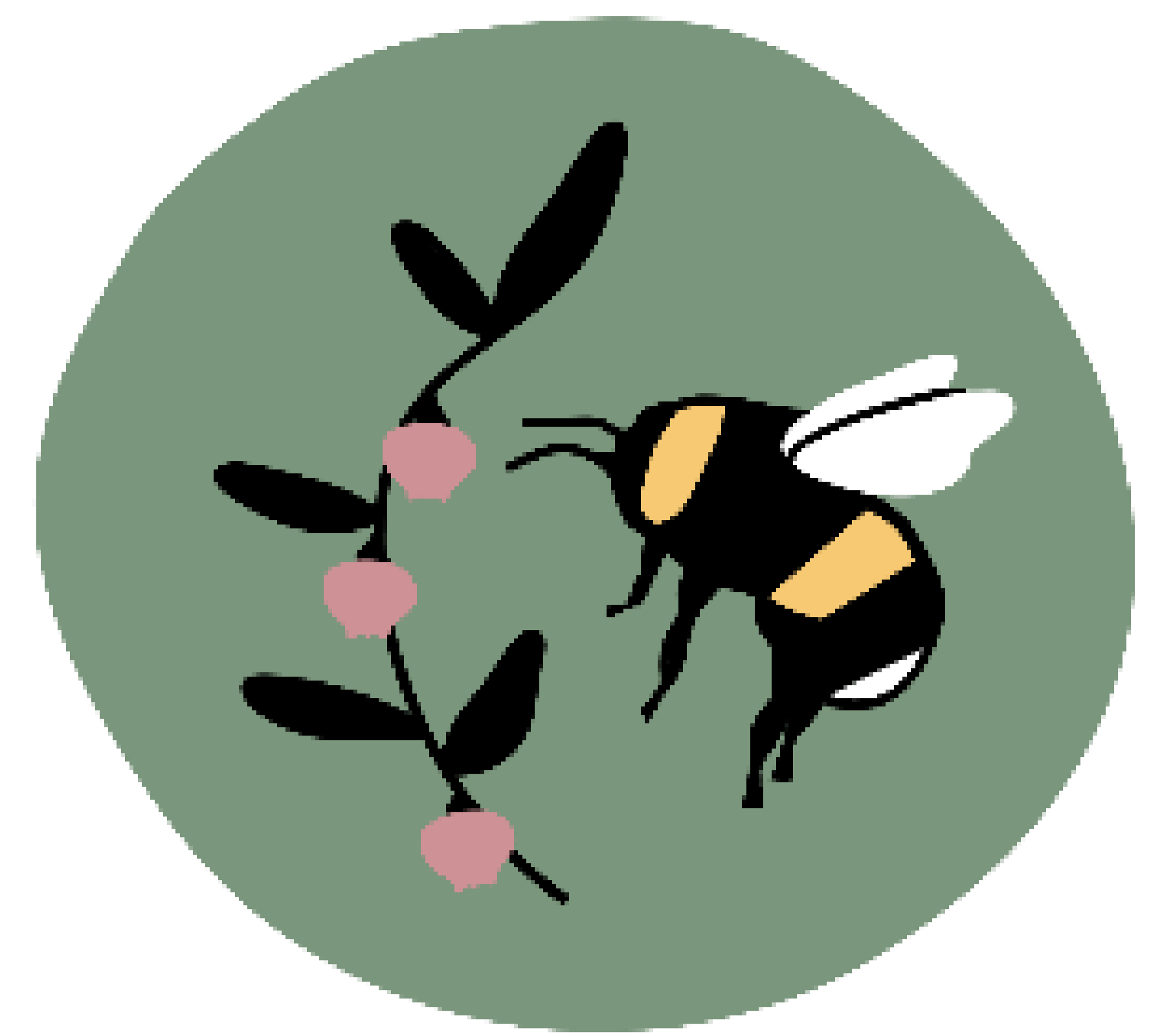


Fig. 2. Summary of the monitoring methods. Transect counts and pan traps are used in parallel in the same sites.

Table 1. Summary of pollinator data collected in different habitats in summer 2022: (A) Transect counts and (B) Pan traps.

A) Transect counts				
Monitoring sites (n=110)	Butterflies		Bumblebees	
	Species	Individuals	Species*	Individuals
MYTVAS-areas* (n=40; 10x50 m)	45	2952	22	1326
2 x 250 m transects	55	5023	24	2402
Arable field margins (n=40)	47	2271	20	1157
Meadows (n=25)	46	1397	21	752
Forest road verges (n=20)	37	989	12	290
Protected forests (n=15)	24	366	6	203
Alpine fells (n=10; 1 x 250 m)	20	217	11	401
Total species and individuals	66	8192	29	4129

* Agricultural areas with previous butterfly monitoring
** Only the species that were identified at the species level in the field

B) Pan traps				
Monitoring sites (n=133)	Solitary bees		Bumblebees	
	Species	Individuals	Species**	Individuals
Arable field margins (n=40)	82	1383	23	1239
Meadows (n=27)	75	829	22	737
Forest road verges (n=20)	59	703	17	1406
Commercial forests (n=20)	37	203	17	406
Protected forests (n=16)	33	253	14	796
Alpine fells* (n=10)	1	20	11	588
Total species and individuals	105	3391	29	5172

* Only two pan traps per site
** *Bombus terrestris* -group includes three species

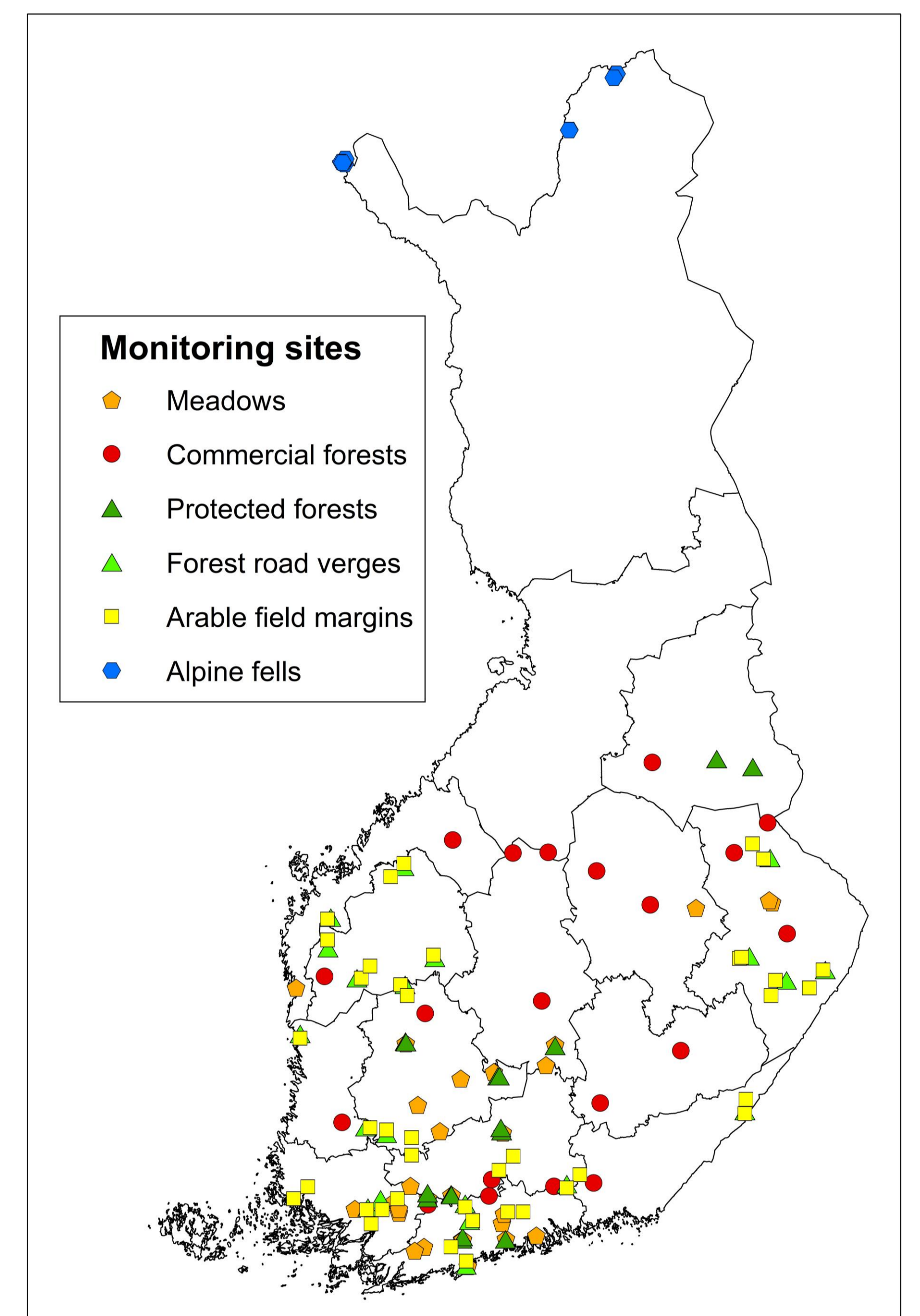


Fig. 1. Map of the 134 monitoring sites located in different habitats in summer 2002.

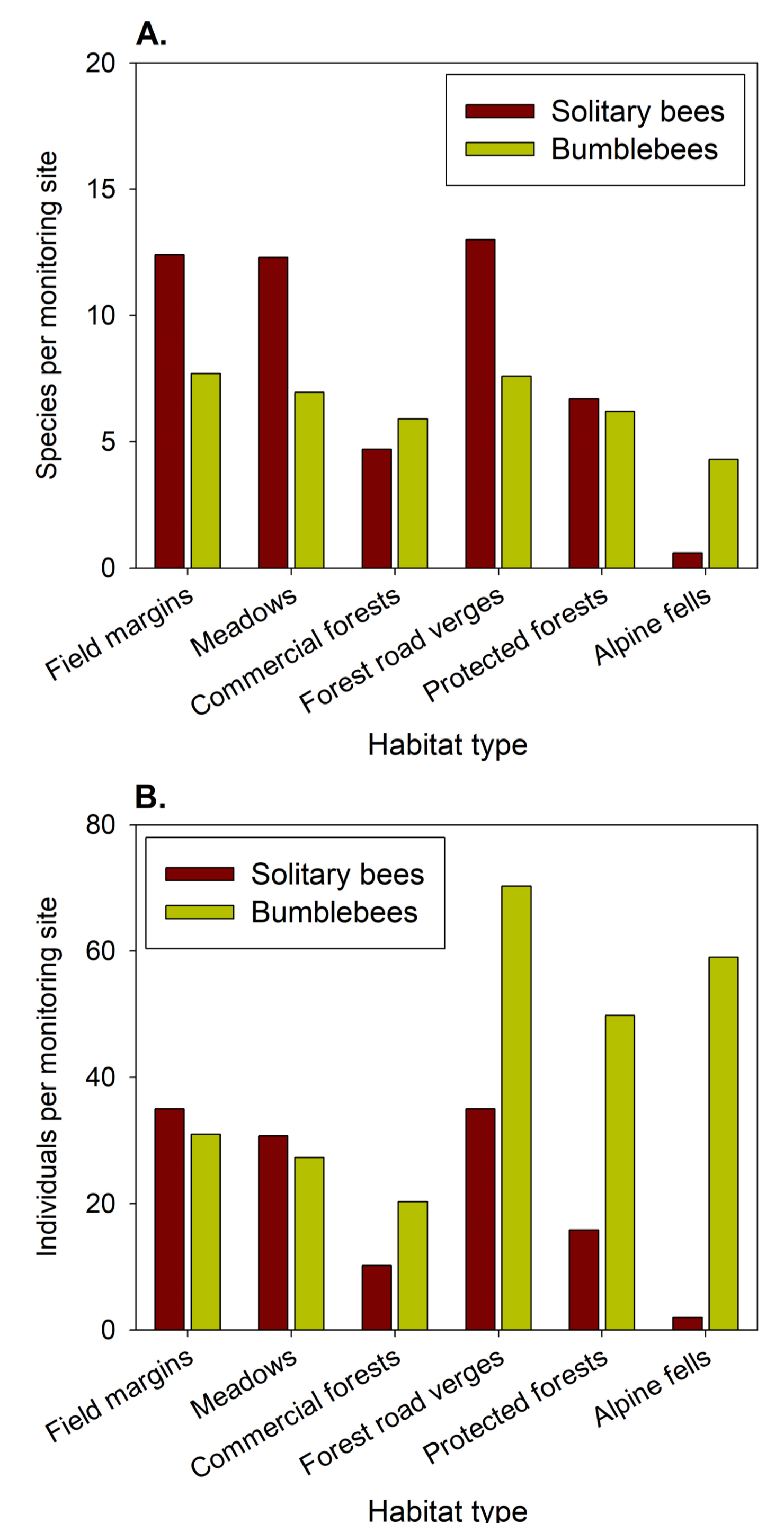


Fig. 3. Average (A) species richness and (B) abundance of solitary bees and bumblebees in different habitats per monitoring site based on pan traps (4 traps per site, except in fells 2 traps per site).