Introduction: Visual assessment of presence and abundance of plant species are regularly done in permanent sampling plots to monitor change in vegetation. Precision in such data is poor and inter-observer differences cast some doubts on their reliability when considering individual species. It is not clear, however, what effect the poor data quality has when considering the full species list in a multivariate analysis.

Aim: To evaluate the possibility to distinguish plots from each other in a PCA, under reasonable inter-observer variation.

Methods: Data from Swedish vegetation monitoring, temporarily using multiple observers in coniferous forest, subjected to PCA.

Data A: Two independent assessments of 212 plots spread over Sweden. The distance d (PC1, PC2) between two independent assessments of the same plot, was calculated (Fig 1). Samples at a larger distance than d from any of the two assessments were counted. The total percentage per data set was considered as the “separation” of sample plots from all other data collected. Separation was calculated based on all species recorded, and after randomly eliminating species.

Data B: Ten independent assessments of 8 plots in each of two vegetation types that were visually distinguishable but with a large overlap in species composition (Fig 3).

Results
• Separation of a plot in Data A increased with number of species included in analysis (Fig 2), indicating that a potential bias in abundance assessment is not consistent over species
• The two vegetation types were clearly distinguishable in Data B, but sample plots from the same vegetation types were only rarely so (Fig 4)

Fig 2. Separation (%) increase with number of species in analysis (data A)

Presence/absence data, sometimes considered more reliable than cover data, is not better
• Data A: Separation was higher when using cover estimates (97%) than when using only presence/absence of species (94%) in data A
• Data B: The ability to separate vegetation types decreased when using only presence/absence of species (Fig 4)

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