Background: Estimation of abundance in vegetation sampling involving observers is almost always characterised by observer error, although such error is rarely reported.

Aims: To quantify observer error in population estimation of the rare plant species *Physaria filiformis* in Missouri, USA.

Methods: The abundance of *P. filiformis* was estimated within 25-m^2 plots by six trained observers with varying experience levels over 10 years. Observers assigned plots to six predefined density classes. A total of 477 plots were estimated annually, and actual counts were conducted on ca. 10% of the plots to assess per cent agreement of estimates with counts.

Results: Over a third of the estimates of plant abundance evaluated for accuracy (36.4%) deviated from exhaustive counts. The majority of the misestimates were underestimates by one density class (29.4%). The number and type of misestimates varied systematically with density class.

Conclusions: Observer error could be explained to some degree by variation in population density, but not by experience. It appears that inherent differences exist among observers that cannot be entirely compensated for by experience or training. Observer error in this system represents a systematic bias, and can be compensated for by use of correction factors, which would ideally be both density class-dependent and observer-specific.