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Editors Choice

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As my Editor's Choice article from this issue I have selected a paper by Helen Alexander et al. (2009) entitled "Detection, survival rates, and dynamics of a cryptic plant, *Asclepias meadii*: applications of mark-recapture models to long-term monitoring studies". This study addresses the difficulties in predicting population trajectories caused by imperfect censuses in demographic studies. It follows on from several recent papers in *Journal of Ecology* (Kéry & Gregg 2003, 2004; Lesica & Crone 2007; Shefferson & Simms 2007; Shefferson & Tali 2007) that have addressed the fact that, although plants stand still and wait to be counted, as John Harper noted, ensuring that all of them are accounted for in a census poses a challenge. The three main problems are (i) that many plant species can become dormant for one or more years, and then re-emerge, (ii) that emergent herbaceous perennial plants can be very hard to find in a given year if they suffer heavy herbivory, and (iii) even without these complications, detection rates can be poor. For example, flowering plants are likely to be more conspicuous than vegetative plants. Problems such as these might present little difficulty for estimating changes in the size of a population if detection probability remained constant between years, or was equal for plants of different ages, sizes and status, but this is not the case.

Author Helen Alexander

Mead's milkweed (*Asclepias meadii*) is a very rare, long-lived perennial species of prairies and glades with low annual reproductive output. Many years can pass before newly recruited plants achieve flowering status. Unless plants have been recorded and marked on previous occasions, non-flowering and grazed plants are very difficult to find, especially in years in which tallgrass prairie habitats are not burnt. Alexander et al. used 15 years of data and mark-recapture methods to estimate the size of a population of Mead's milkweed, and to predict its future trajectory. They also carried out repeat surveys within one year of the study to determine the proportion of plants marked in a first survey that became almost undetectable later in the flowering season as a result of herbivory, and the likelihood of surveys made on different occasions failing to record plants that were not subject to herbivory.

The dense prairie vegetation makes it difficult to locate vegetative stems of Mead's milkweed (highlighted).

Mead's milkweed is a federally-threatened species. Accurate counts of plants are vital to assess the success of different management regimes for conserving its remaining populations. However, Alexander et al. report low detection probabilities, especially for plants that had not been marked in previous years, and great variation in recorded population size and in the proportion of plants flowering between years. Their analyses allowed them to infer that the actual population size was much higher each year than the population size they recorded, and that, despite strong variation in the estimated population size, there was slow population growth that could not be appreciated from the year by year counts.

Alexander et al. make important recommendations for ecologists to consider before embarking on demographic surveys of plants. Their proposals are likely to be especially pertinent for programmes of work that involve monitoring and management of rare species.

They suggest that, when detection probability is low, sampling protocols should aim to maximise searching efficiency per unit area, even if this means surveying somewhat smaller areas and fewer plants. Although dormancy is usually the explanation offered for periodic absences of individual plants during a lengthy observation period, herbivory and detection failure were also important causes. It is advised that if surveys are carried out early in a species' growing season, plants may be missed because they emerge too late to be observed. Alexander et al. recommend that, at the start of any monitoring programme set to last for several years, repeat blind surveys should be carried out within the same year to determine whether plant detectability is a problem for these or other reasons. Finally, the authors recommend the development of improved sampling and analytical methods to overcome the problems in understanding current population behaviour and predicting future population trends when the ability to detect plants in monitoring exercises is imperfect.

In the same issue of *Journal of Ecology* there is also a Future Directions article by Maestre et al. on the stress gradient hypothesis for competition and facilitation in plant communities. This paper develops interesting and important new hypotheses that could be tested experimentally to lay the foundation for reconciliation of differences between the results of previous studies in this field. This paper is timely in view of the forthcoming British Ecological Society Symposium on Facilitation in Plant Communities, which will be organised by Rob Brooker and Ragan Callaway, and held at the University of Aberdeen from 20-22 April this year. Details of the meeting, and registration, are available at:

http://www.britishecologicalsociety.org/meetings/index.php

The list of speakers and topics promises an excellent meeting, and attendance is recommended for all with an interest in this field. Accommodation is limited, however, so that early registration is advisable. If you are unable to attend, however, all is not lost, because *Journal of Ecology* will be publishing the best papers from this meeting as a Special Feature, late in 2009.

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