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Peirson's milkvetch is a short-lived perennial plant whose life span is often shorter than the length of time between successful germination events. This is a common strategy among desert annuals: they survive unfavorable conditions of drought and heat as dormant seeds, and germinate, grow, flower, and produce new seeds quickly during periods when conditions are favorable, such as winters when there is sufficient rain. Desert annuals, and short-lived perennials like Peirson's milkvetch, are called *ephemerals;* they complete their life cycles when conditions are favorable, and survive unfavorable periods as dormant seeds in the soil.

The overall status and distribution of desert ephemerals is expressed by the plants living at any given time, plus the potential for future germination and growth as found in its dormant seeds in the soil, known as the *seed bank.* Dormant seeds in the soil allow plants to survive long periods of unfavorable growing conditions, both seasonal and annual. The true potential for a desert ephemeral rests not in the plants that are actively growing at any particular point in time but in the seed bank, the dormant seeds resting in the soil awaiting the return of favorable conditions for their germination. If both living plants and dormant seeds are censused, an accurate estimate of the plant's potential, and status, may be calculated at *any* point in time; it is not necessary to make counts over a series of years, or wait for a season when germination and growth occurs. During a "good" year, such as the spring of 2001, the plant's status may be expressed mainly through a census of actively growing plants. During a dry season, such as the spring of 2002, dormant seeds in the soil may be more important in assessing the status. The balance between living plants and dormant seeds shifts constantly in response to climate; these shifts, sometimes profound, are normal occurrences, and do not reflect a change in status as long as the sum of living plants and dormant seeds remains constant.

Germination studies *could* be undertaken as a next step to answer the following questions: 1) What are the environmental conditions that are optimum for seed germination, and 2) how long do dormant seeds remain viable? To answer the first question, seeds (of known age) should be collected and experimentally subjected to a number of different conditions of moisture, temperature, humidity, and daylength. This is normally done under controlled conditions in a growth chamber. The result would provide a theoretical combination of optimum and threshold conditions favoring germination, and the percentage of seeds that would potentially germinate under such conditions, at least in a laboratory situation. However, the results of laboratory experiments on seed germination, while of scientific interest, cannot always be applied to “real world” situations, and the validity of any conclusions drawn from such experiments could be subject to ongoing scientific debate. Additionally, we already know that under favorable environmental conditions, large numbers of seeds can germinate in nature. The second question would take many years to answer, as a large number of seeds of known age would need to be collected and stored, with some undergoing germination experiments each year for 10-20 years or more. Presumably the viability (proportion of seeds germinating) would decrease each year until it approached zero. Such an experiment could span several professional careers before the answer is known!

Germination experiments would provide valuable scientific information, and would increase our understanding of the biology of the species, but the relevant question is, would the effort, time, and expense they would require be cost effective in providing correspondingly valuable information for assessing the status of the species? We believe it would not; the studies carried out in 2001 and 2002 provide, in total, the information necessary to make a realistic, scientifically sound, and legally adequate overall assessment of the status of the species. It is important to note that many listing decisions have been made based on much less comprehensive information on the biology and potential impacts than we have currently available for Peirson’s milkvetch.

The next step, in my view, which could be taken with minimal expense and time investment, would be to re-census the 25 sites we visited in 2002 to ascertain survival through their second summer season. With the extremely dry conditions through the winter of 2001-02 and spring of 2002, and with the availability of weather records from Buttercup and Cahuilla RAWS stations, survival data could be correlated with weather conditions quite different from those of 2001. The next priority would be to sample the seed bank again, since there should have been a substantial addition of seeds in the spring of 2002 from the prolifically reproducing second-year plants. As a followup to studies conducted in 2001 and 2002, this would provide far more practical information on the population biology of the species in the field than laboratory experiments on germination.

It is important to point out that the quest for relevant knowledge should always be the first priority of any scientific inquiry and, in general, studies that are designed in response to non-scientific or cursory critique seldom serve to advance that knowledge.

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