

GLOBAL RE-INTRODUCTION PERSPECTIVES

Re-introduction case-studies from around the globe



**Edited by
Pritpal S. Soorae**



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Cover photo: Clockwise starting from top-left:

- Formosan salmon stream, Taiwan
- Students in Madagascar with tree seedlings
- Virgin Islands boa

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Establishment and re-introduction of the field cricket into Southern UK

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Introduction

The field cricket (*Gryllus campestris*) is one of the UK's rarest insect species and is increasingly threatened over many parts of its mainland European range. In the UK it has been regionally listed as endangered (Shirt, 1987). As a result of alteration and fragmentation of its highly selective grassland habitat, by the late 1980's, the UK population of *G. campestris* was reduced to a single colony of fewer than 100 individuals in West Sussex. In 1991 the species was placed on English Nature's **Species Recovery Program** (SRP).

Goals

- Goal 1: The overall objective of the project is the conservation and protection of *G. campestris* in the UK.
- Goal 2: Establish an **ex situ** breeding program and associated health screening protocol to provide the large number of animals needed for the field establishment and re-introduction elements of the program.
- Goal 3: Identify and manage 10 suitable former range sites in Southern England in readiness for establishing new populations.
- Goal 4: Establishment and, where necessary, re-introduction of *G. campestris* into the prepared new sites with follow up monitoring plan in place.

Success Indicators

- Indicator 1: Identification of, and sympathetic management plan for, suitable former UK range area sites.
- Indicator 2: Assurance of ability of surviving UK colony to sustain annual harvesting of three pairs of founder crickets for the **ex situ** breeding and release program.
- Indicator 3: Development of health screening protocol to clarify and monitor surviving wild UK *G. campestris* population.
- Indicator 4: Confirmation of secure, reproducing populations on 10 UK sites.



Field cricket - female



Release site showing bracken encroachment

Project Summary

Feasibility: Extensive field surveys by the conservation agency English Nature confirmed that by the late 1980's the status of the surviving UK *G. campestris* population had reduced to a single colony in West Sussex. The reason for the cricket's decline was confirmed as alteration and fragmentation of its highly selective grassland habitat. In 1990 a *G. campestris* Species Recovery Program was developed with an Action Plan specifying the establishment of 10 secure field populations in areas of the species'

historic range. Because the surviving wild population was too low to support direct translocation of the large number of animals that would be needed for establishing the intended new colonies it was necessary to develop an *ex situ* breeding plan in partnership with the Zoological Society of London. This also involved the development of a health screening protocol to clarify natural health profiles in the surviving wild population and monitor health profiles in the *ex situ* populations, especially in the pre-release program phase.

Implementation: In 1992 the breeding and rearing initiative was established at the Zoological Society of London. The *ex situ* breeding and rearing plan entailed collecting three pairs of sub-adult crickets from the surviving wild population each spring to be bred at the Zoo to produce large numbers of late-instar F₁ generation nymphs for the new field colony establishments and where necessary re-introduction actions. To help clarify natural health profiles, a fecal screening and post mortem protocol was implemented for all field-collected founder crickets. The crickets were housed in an isolated breeding room to reduce the risk of disease contamination from non-native insect species. The husbandry methods are detailed in Jones *et al.*, 1999. Separate progeny lines were maintained to ensure maximum genetic diversity in the *ex situ* F₁ population prior to combining for field release. Overall breeding and rearing success has been high, with annual mortality rates ranging between 10 - 20% in the F₁ nymphs. Between 1992 and 2007 the breeding program provided in excess of 17,000 late-instar nymphs for the SRP field establishment program.

Post-release monitoring: Four of the seven field colonies established with the *ex situ* bred crickets were still extant in 2007, the longest of which was shown to have persisted to the 8th generation. The knowledge derived from monitoring the fluctuation dynamics of the field-released *G. campestris* populations has informed optimal site management requirements for the species, and helped clarify the subtle environmental factors influencing colony survival. The breeding program has also helped raise public awareness of the field cricket and its

conservation issues and provides a model for developing similar recovery initiatives for the species in other range countries (Pearce-Kelly *et al.*, 2007).

Major difficulties faced

- Pre-release health screening in 1996 and 1997 confirmed the presence of gregarine parasites in the captive population, preventing field releases in both those years (Cunningham *et al.*, 1996).
- Several of the release sites could not be sufficiently managed to enable persistence of the established population. This necessitated either re-introductions or the abandonment of a site in favor of better sites.



Field cricket rearing unit at the Zoological Society of London, UK

Major lessons learned

- The importance of effective post-arrival and pre-release health screening protocols was highlighted by the discovery in 1996 and 1997 of gregarine parasites in the captive population, preventing field releases in both those years (Cunningham *et al.*, 1996). This underlines the necessity of ensuring that adequate infection barriers are in place for all *ex situ* populations destined for re-introduction (Pizzi, 2004).
- It quickly became apparent that the original Action Plan remit of realizing 10 secure populations of *G. campestris* in the specie's UK range is reliant on ongoing monitoring and management of the selected sites. As is thought to be the case in natural *G. campestris* population/site dynamics, established local populations are prone to decline and even complete die off when site conditions alter to sub-optimal states. This consideration necessitates sensitive monitoring and at times re-introduction or enforcement actions. The longer term objective which is currently being implemented is to realize sufficient connectivity between these sites to enable free movement between sites.
- The public and media response to the *G. campestris* Species Recovery Program proved that invertebrate focused conservation efforts are capable of realizing as high a level of interest and support as are vertebrate programs.

Invertebrates

Success of project

Highly Successful	Successful	Partially Successful	Failure
		√	

Reasons for success/failure:

- The *G. campestris* Species Recovery Program is an ongoing conservation effort and as such the target number of secure site populations have yet to be realized.
- The natural propensity for *G. campestris* sites to become sub-optimal (as detailed in Major lessons learned section above) without ongoing active management intervention means that some site populations are almost certain to experience declines or even local population extinctions.

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Project partners

- **English Nature (renamed Natural England), Northminster House, Peterborough PE1 1UA, UK.**
- **Mike Edwards, Ecological Consultant.**