

# Translocation of the silver-studded blue *Plebejus argus* to Cawston Heath, Norfolk, England

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## SUMMARY

Two translocations of silver-studded blue butterflies *Plebejus argus* (30 in 2006 and 72 in 2007) were made to an area of suitable unoccupied heathland from a nearby donor site. Monitoring of the 2006 release site in 2007 revealed the presence of only four butterflies. Several factors may have accounted for the low numbers. Poor weather (wet and cold) during the flight period may have been partly responsible, but the trend of earlier emergence of silver-studded blues may be a factor; over the last few years, there has been a trend towards earlier emergence and peak counts in June rather than July. Consequently, if the donor butterflies were collected later in the flight period after the peak count as was the case in 2006 and 2007, the proportion of fresh, actively-laying females may have been lower than in previous successful translocations conducted at other localities. In view of this, it is recommended that a further 30 fresh female butterflies are collected early in the flight period in 2008 and are translocated in order to enhance establishment success.

## BACKGROUND

In the UK the silver-studded blue *Plebejus argus* mostly occurs on lowland heathland and calcareous grassland where early successional stages affording a warm microclimate are preferred, particularly where succession is held in check by grazing. The silver-studded blue has undergone a severe decline in range estimated at 80% over the last 100 years, mainly attributable to habitat loss and lack of suitable habitat management; it has become extinct in Scotland and northern England, and is scarce throughout most of the rest of England remaining widespread only on the southern heathlands of Dorset and Hampshire. It occurs throughout much of Europe except Scandinavia, but it is declining in the north-west of its continental European range. In Great Britain the silver-studded blue is classified as 'Nationally Scarce' and is a UK Biodiversity Action Plan species (anon 1999).

In summer 2005, five years after the production of a Norfolk Action Plan for the silver-studded blue, Butterfly Conservation Norfolk Branch (BCNB) commissioned a further study of the status of this butterfly in Norfolk (Harris 2005). One objective was to identify heathland sites with potential for translocation of *P. argus* in order to increase

and expand the number and distribution of populations of this species in Norfolk. Cawston Heath in the north of the county met all the habitat criteria for a translocation in summer 2006, provided that adequate safeguards were in place to avoid adverse impacts from essential management operations scheduled to be carried out in the two years after translocation.

Conservation of *P. argus* in Norfolk is co-ordinated through a Local Biodiversity Action Plan (LBAP) for the species which is implemented by the Heathland Topic Group chaired by Norfolk County Council. The Group supported the proposal to translocate *P. argus* to Cawston Heath in summer 2006 and 2007, and funding for the work was secured from the Norfolk Biodiversity Partnership. Permission for the translocation was obtained from the Trustees of Buxton Heath Site of Special Scientific Interest (SSSI) (donor site) and Cawston and Marsham Heath SSSI (recipient site). Consent for removal of butterflies from Buxton Heath was also given by English Nature Norfolk Team. Management requirements for Cawston Heath were discussed fully with Norfolk Wildlife Trust (NWT) Site Manager (John Milton). As a result of these discussions, a two stage translocation over two years was planned so as

to avoid adverse impacts from essential management operations at the heath, but still allow the translocation to proceed at the earliest opportunity. In summer 2006, the first stage of the translocation to Cawston Heath was undertaken by BCNB. Management during winter 2006/07 was aimed at creating a larger area of good quality habitat for the release of butterflies in the subsequent summer.

This case study describes these two translocations and the habitat management work undertaken.

## ACTION

**Donor site:** Monitoring of *P.argus* on all extant Norfolk sites in 2005 revealed that Buxton Heath SSSI (National Grid ref: TG 173217) located 12 km north of the city of Norwich, supported the largest population with over 400 butterflies recorded and active management for the butterfly well-established. On this basis it was chosen as the donor site for the translocation. Pre-translocation counts were also carried out on 29 and 30 June 2006, and recorded 599 and 551 butterflies respectively, indicating that the population was still increasing in size and distribution on this heath in response to management.

**Translocation strategy:** As the two areas (A and B) identified as being suitable for *P.argus* would require further foraging in winter 2006/7, it was considered inadvisable to release butterflies directly onto them as the foraging was highly likely to have an adverse impact on establishment. To avoid this, a 2-stage translocation coupled with management was planned as follows:

- July 2006 - 30 butterflies to be released at a location some distance from management areas A and B, and a buffer zone with no management to be maintained around the release site
- Winter 2006/7 - foraging of areas A and B combined with removal of humus to expose the underlying sandy mineral soil
- July 2007 - 30 butterflies to be released at a second area of the heath close to the foraged/scalped areas

- no further management for 2 to 3 years, apart from hand-pulling of pine *Pinus* seedlings

Due to the sedentary nature of *P.argus*, it was judged to be very unlikely that butterflies would move far from the release site. This factor, together with the operation of a buffer zone (see: Winter 2006/07 management, below), was expected to avoid any adverse impacts of heathland management over the winter. A translocation of more butterflies in 2007 to a different location close to the foraged areas would also have the advantage of establishing a second colony which it was hoped would speed up the colonisation of the heath. If the translocation was successful, the butterfly would then have a period of 2 to 3 years to establish and increase in numbers before further management was required. During this time, the size and location of the colonies would be monitored so that management could be modified as appropriate.

**Release site:** The 2006 release site at Cawston Heath (National Grid ref: TG 16362363) was located south of the east-west track running through the site and approximately 200 and 80 m to the east of areas A and B respectively. These had been forage harvested in winter 2004/5 (Fig. 1); heather was cut down to a height of about 15 cm, cuttings were collected by the machine and removed. These two areas (A and B) had been identified as being suitable for *P.argus* but requiring further foraging and soil scarification in winter 2006/7 to create a shorter, more open sward with some bare soil. The 2006 release site was also selected for its close proximity to a sheltered sandy track and other areas of bare ground to the south which afforded good microclimate conditions for ants (*Lasius* spp.). The silver-studded blue has a symbiotic relationship with ants, which tend the larvae from hatching to pupation, protecting them from predators and parasites in return for nutritional sugars. The relationship appears to be *Lasius*-specific, and the presence of *L.niger* and *L.alienus* at Cawston was confirmed as part of the assessment of the suitability of the heath for a translocation.

The release site was marked with a two wooden pegs painted yellow placed either side of the track about 6 m apart, and photographed from different viewpoints to aid relocation. The butterflies were released either at or between these pegs (Fig. 2).



**Figure 1.** The 2006 release site (marked with a yellow peg) viewed from the east with buffer zone extending to the strip of bracken *Pteridium aquilinum* in front of the pine trees in the background (Photo: Jane Harris)

**2006 translocation:** The translocation was undertaken on 5 July. The weather conditions at the time of collection were warm and sunny subsequent to a heavy rain storm in the morning, with light winds. A total of 22 females, four males and two copulating pairs were collected at Buxton Heath between 15:00 and 16:00 h. Individuals were netted and transferred to plastic field boxes, but copulating pairs were captured directly into the containers. The boxes were kept cool out of the sun.

The butterflies were released within 2 to 3 hours of capture at 18:00 h when it was expected that they would not be as active as earlier in the day and thus be more inclined to settle close by. The containers were also opened low down in the heather *Calluna vulgaris* when the butterflies were liberated in the hope of further reducing the likelihood of the butterflies straying far immediately upon release (Fig. 2). Most of the butterflies flew out onto the heather and subsequently settled and moved down into the vegetation to roost. Several flew a short distance away, but all landed on heather within 10 m of the release site, most settling on heather south of the track. When the site was visited by Mandy Gluth the following day, 4 of the 30 butterflies were seen, all within 10 m of the release site.



**Figure 2.** Release of donor butterflies at Cawston Heath, 5 July 2006 (Photo: Bernard Watts)

**Monitoring:** The translocation site was monitored in June and July 2007 for the presence of *P. argus*.

**Winter 2006/07 management:** Essential winter management was undertaken by NWT and was carefully planned to leave an undisturbed buffer zone around the 2006 release site. Heathland vegetation dominated by heather was foraged to a height of 15 cm, but additional measures were agreed to improve *P. argus* habitat around the 2007 release site as follows:

- 5 m wide swathe of heather to be cut very low along the north side of the track to create some bare sandy ground
- scarification of a strip of ground along the south side of the track
- heather on the track edges and centre to be left uncut

Figures 3a and 3b show these areas after management and the 2007 release site.



**Figure 3a.** Winter 2006/07 management close to the 2007 release site (view from west to east) with sections of low cut heather visible on the north side of the track (Photo: Jane Harris)



**Figure 3b.** Winter 2006/07 management close to the 2007 release site, view from east to west. The release site is indicated by the red arrow (Photo: Jane Harris)

**2007 translocation:** The 2007 translocation took place on 5 July. Butterflies were collected from Buxton Heath between 11:00 and 13:00 h. The weather was dull and rather overcast, but warm (22°C) with a light south-westerly

wind. A total of 50 females, 20 males and a copulating pair were caught and transferred as in 2006. The number of butterflies was increased from that translocated in 2006 since a count of 475 adults was recorded at Buxton Heath on 20 June (despite poor weather during the flight period) and thus it was considered that removal of 72 butterflies would not adversely affect the viability of this population.

The release site was on the south side of the main track. About 80% of the females remained close to the release site, with the remainder flying less than 5 m from it before settling. The males were more active with about half settling within 15 m and the rest flying a greater distance away.

## CONSEQUENCES

**Monitoring of the 2006 translocation site:** Monitoring of the 2006 release site commenced on 3 June 2007, relatively early in the season for *P. argus* but timed as such due to early emergence of the butterflies at other Norfolk sites. None were found until 20 June, when a female was recorded about 30 m from the release site. A male was subsequently seen on 1 July and a male and female on 7 July. Although the last sighting was 2 days after the second translocation, it was close to the 2006 release site and the sedentary nature of the butterflies means that it was unlikely that they were from the 2007 release.

Thus the monitoring showed that a very small number of butterflies had emerged as a result of the first translocation. This was disappointing, although there were several factors that may account for the low numbers. The poor weather during the flight period may have been partly responsible, but the trend of earlier emergence of silver-studded blues may also be a factor. Buxton Heath is monitored approximately every 5 days during the flight period which provides a fairly good indication of the date of the peak flight period. Over the last few years, there has been a trend towards earlier emergence and peak counts in June rather than July (date of peak count over the last 4 years as follows: 2004 - 3 July; 2005 - 7 July; 2006 - 29 June; 2007 - 20 June). Consequently, there is concern that if the donor butterflies were collected later in the flight period after the peak count, as was the case in 2006 and 2007, the proportion of fresh, actively-laying females may be lower than in previous successful translocations.

**2008 translocation:** In view of these concerns, it is recommended that a further 30 fresh female butterflies are collected from Buxton Heath early in the flight period in 2008 and are translocated to either of the two release sites on Cawston Heath. This would compensate for the potentially poor condition of donor butterflies released on the previous two translocations in increase the likelihood of successful establishment and colonisation.

**Ongoing monitoring:** Translocation sites and the surrounding heath will be monitored in July 2008 for the presence of *P.argus*. If progeny of the translocated butterflies are observed, it is recommended that a set route of known length is walked 3 times during the flight period and butterflies counted so that their density and annual indices can be calculated to determine population trends on the site.

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#### REFERENCES

Anon. (1999) *UK Biodiversity Group Tranche 2 Action Plans - Volume IV: Invertebrates* (March 1999, Tranche 2, Vol. IV, p.379). <http://www.ukbap.org.uk/UKPlans.aspx?ID=522>

Harris J.E. (2005) *Current status and future prospects for the silver-studded blue butterfly in Norfolk 2005*. Report to Butterfly Conservation, UK.

Harris J.E. (2006) *Translocation of the silver-studded blue (Plebejus argus) to Cawston Heath – July 2006*. Report to the Norfolk Biodiversity Partnership, UK.

Harris J.E. (2007) *Translocation of the silver-studded blue Plebejus argus to Cawston Heath Stage 2 - July 2007*. Report to the Norfolk Biodiversity Partnership, UK.