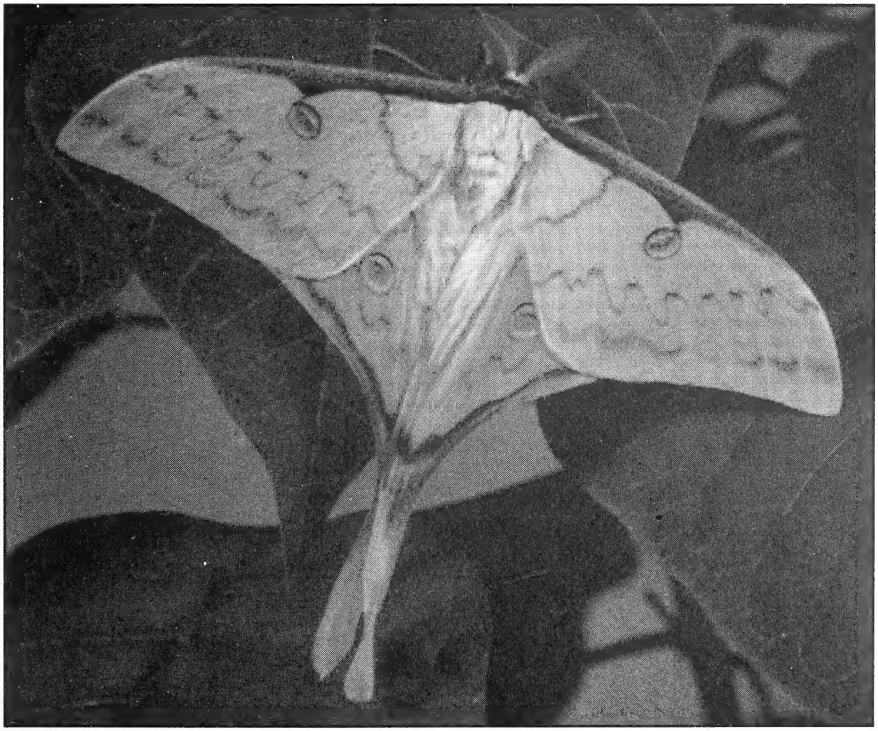
Invertebrate Conservation News

Number 57 October 2008



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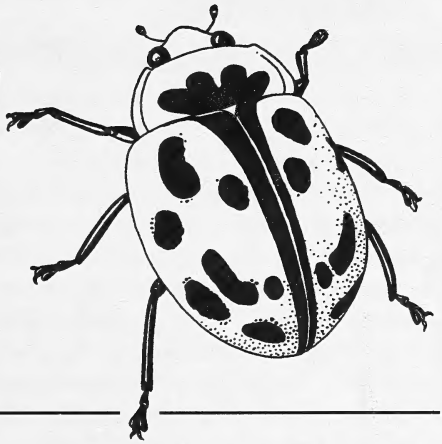
INVERTEBRATE CONSERVATION NEWS



No. 57, October 2008

EDITORIAL

Five years ago, after high summer temperatures in the UK, the editorial for *ICN* 42 mentioned weather-related fluctuations in invertebrate populations. In the summer of 2008, sunshine and warm days were in short supply in most parts of the UK, and the same was true in 2007. Consequently, sun-loving invertebrates have reportedly been scarce, despite the predicted trend towards warmer, drier summers. Following a population crash in a particular species (for example, during a poor summer), colonies at many sites recover rapidly but the species could die out at other sites. Sites can be re-colonised, but only if there is a source of incoming individuals. For this reason, the fragmentation and isolation of habitats is thought to be a key factor in the regional or national decline of many species, especially those that are not very mobile.

Habitat isolation can exacerbate the effects not only of unfavourable events, but also of systematic changes in climate. In principle, any species could respond to climate change by colonising regions which have become climatically favourable, but such adaptation is hampered if the species cannot disperse far enough to cross inhospitable terrain between habitable sites.

As far as the UK is concerned, the general prediction for most regions is that summers will become warmer and drier and that winters will become milder and wetter. There is, however, also a tendency towards greater extremes, some of which will go against the overall trend. Thus, for example, chance local extinctions of sun-loving species during dull summers are perhaps just as likely to occur as they have done previously. Such species are, however, likely to benefit from the general

trend towards warmer summers, which enables them to colonise niches where the micro-climate was previously too cool for them. The reverse is likely to be true for species whose centres of distribution lie in cooler parts of northern Europe.

For all species, the availability of niches beyond the confines of localised habitats can be of key importance. In the relatively cool climate of the UK, warmer summers are likely to increase the range of niches that are suitable for warm-loving species, but such species sometimes also require cool or moist niches during unusually hot summers. An example is provided by Clive Bealey's study of the Silver-spotted skipper *Hesperia comma* at Porton Down, southern England (see *ICN* 33). In the hot, dry summer of 1995, the larval foodplants were desiccated on the normally favourable warm micro-sites, so that larval survival was favoured only on the cooler north-facing slopes.

Recognition of habitat isolation as a problem has been slow to influence conservation policies, but there is now more commitment (at least in the UK) to 'landscape-scale' conservation than at the time of the October 2003 *ICN* editorial. As a result, there have been various agri-environment schemes, in which farmers are given incentives to protect and restore habitats in the wider countryside. These schemes should help to maintain and perhaps re-establish the geographic distributions of species that have been declining. Such species might otherwise become confined to a few sites, perhaps later undergoing national or even global extinction.

Schemes for enhancing 'connectivity' between habitats are a welcome development, but they could become increasingly difficult to promote alongside the needs of a growing human population. The difficulty is exemplified by the recent suspension of agricultural set-aside schemes in the European Union. Although set-aside was not designed to help conservation, it enabled various species to regain some of the abundance that they enjoyed before widespread agricultural intensification. Wherever plans for landscape-scale conservation can be sustained, there will be a need to take account of the effects of climate change, which is affecting the geographic ranges of many invertebrates.

Where natural processes of re-colonisation fail, there is sometimes a case for re-establishing species artificially. This was recognised many years ago in the UK by member-organisations of the umbrella group now called Invertebrate Link. The group produced a code of conduct for insect re-establishment in the 1980s. The code, which is currently

being revised, sets out criteria by which proposed re-establishments can be evaluated. It was drafted in the light of some controversy, since there are divergent views on the subject. At one extreme, a laissez-faire approach could encourage reckless releases of invertebrates, which could be harmful in various ways. At the other extreme, a fundamental opposition to meddling in natural processes might fail to allow for the fact that human land-use is inhibiting those same processes.

Climate change has implications not only for the conservation of native invertebrates, but also for the control of invasive species. Through worldwide human trade and travel, many invertebrate species have been transported far beyond their natural regions of distribution. Given a favourable climate, alien species can become established and in some cases thrive sufficiently to threaten native fauna and flora or the human economy. One well-known example is the Giant African snail *Achatina fulica*, which has become a pest in many tropical regions outside its native range. In some cases, unfavourable climates have prevented alien species from thriving, but new problems could emerge with climate change.

NEWS, VIEWS AND GENERAL INFORMATION

Review of protected species-list in the UK

As reported in *ICN* 56, a conclusion has been reached in the fourth quinquennial review of the list of invertebrates protected under the UK's Wildlife and Countryside Act 1981. The only change is that, with effect from 6th April 2008, it has become a criminal offence intentionally to kill, take or injure any wild-caught specimens of the Roman snail *Helix pomatia* or to possess or offer them for sale. There is, however, still a question regarding two burnet moths, the Slender-Scotch *Zygaena loti* and the Talisker (or Narrow-bordered five-spot) *Zygaena lonicerae jocelynae*, which were not added to the protected list (Schedule 5) but might be added eventually if they are first listed in Scotland, where their UK populations occur.

The fifth quinquennial review began in March 2008, with an initial consultation of interested organisations. The government agency responsible, the Joint Nature Conservation Committee (JNCC), is not seeking to add any invertebrates to the existing list in Schedule 5, but is

recommending the removal of one species: the Essex Emerald moth *Thetidea smaragdaria*. This species has not been seen in the wild since 1991, despite specific targeted searches of all known sites and despite the fact that its larvae are not likely to be overlooked. Also, no captive British stock remains for use in re-establishment.

Buglife – The Invertebrate Conservation Trust responded to the consultation with some general comments about the consultation process, which can be summarised as follows:

- If a species is no longer threatened by the activities covered in Section 9, it should be de-listed.
- The consultation process needs to be long enough (i.e. more than three months), so that the societies can have a chance to discuss proposals and to reach a consensus.
- The UK government ought to respond more promptly to the recommendations, thus avoiding a repetition of the extreme delays that occurred with the fourth Quinquennial Review.

Buglife also made some suggestions for amendments to Schedule 5, under various clauses of Section 9 of the 1981 Act. These were as follows:

Addition for full protection – all parts of Section 9)
Bedstraw hawkmoth (*Hyles gallii*)
Streaked bombardier beetle (*Brachinus sclopeta*)

Addition to protect from sale only – Section 9(5)
Talisker burnet moth (*Zygaena lonicerae jocelynae*)
Slender scotch burnet moth (*Zygaena loti scotica*)

Addition to protect only from intentional or reckless damage to structures and places used as shelter or protection – Section 9(4)(a)
Distinguished jumping spider (*Sitticus distinguendus*)
Saltmarsh short-spur beetle (*Anisodactylus poeociloides*)
Four-banded weevil wasp (*Cerceris quadricincta*)
Five-banded weevil wasp (*Cerceris quinquefasciata*)
Goat moth (*Cossus cossus*)
Noble chafer (*Gnorimus nobilis*)
Variable chafer (*Gnorimus variabilis*)
Narrow-headed ant (*Formica exsecta*)
Horrid ground weaver (*Nothophantes horridus*)
Mottled bee-fly (*Thyridanthrax fenestratus*)
Heath bee-fly (*Bombylius minor*)
Little whirlpool ramshorn snail (*Anisus vorticulus*)
White-faced darter (*Leucorrhinia dubia*)

Retention of protection, but under Section 9(4)(a) only
Lagoon sand shrimp (*Gammarus insensibilis*)
De Folin's lagoon snail (*Caecum armoricum*)
Lagoon sea slug (*Tenellia adspersa*)
Tentacled lagoon worm (*Alkmaria romijni*)
Starlet sea anemone (*Nematostella vectensis*)
Trembling sea mat (*Victorella pavida*)
Lagoon sand worm (*Armandia cirrhosa*)
Ivel's sea anemone (*Edwardsia ivelli*)
Brackish hydroid (*Pachycordyle navis*)
Lesser silver water beetle (*Hydrochara caraboides*)
Bembridge beetle (*Paracymus aeneus*)
Rainbow leaf beetle (*Chrysolina cerealis*)

Removal from Schedule 5 entirely
Lagoon snail (*Paludinella littorina*)
Northern hatchet shell (*Thyasira gouldi*)
Essex emerald (*Thetidia smaragdaria maritima*) (already recommended by JNCC)

The JNCC seems to take the view that Schedule 5 is not the appropriate instrument for protecting invertebrates from damage to their places of shelter etc., since such protection is in principle covered by laws designed to protect designated sites. This does not, however, seem to work for various sites (e.g. certain very rich 'brownfield') sites, which seem to fail to meet strict criteria for designation.

Czech entomologists arrested in India

In June this year Dr. Petr Švácha, an eminent coleopterist in the Czech Academy of Sciences, was arrested near Darjeeling, West Bengal, India, together with a fellow-entomologist, Emil Kuĉera, a Czech forest official. They were accused of collecting invertebrates without a permit in Singalila National Park, allegedly with the intention of selling certain species on the Chinese medicine market.

On learning about the arrests, members of the international entomological community raised a petition, which was widely circulated on the Internet. The plea was that the two Czech entomologists were engaged only in scientific work and had no intention of breaking any laws. The authors of the petition stated that they knew Dr. Švácha to be a world-renowned specialist on sawyer beetle larvae and a serious academic and they pointed out that he has been a senior scientist at the Institute of Entomology, Academy of Sciences of Czech Republic (formerly "Czechoslovak Academy of Sciences") in Èeské Budìjovice, Czech Republic, since 1985. He is also

the Managing Editor of the *European Journal of Entomology*, a well-known scientific journal produced at his institute.

The authors of the petition suggested that Dr. Švácha had probably failed to realise that he had entered a national park where collecting insects was illegal without a permit under the Wildlife Protection and Biodiversity Act. On this basis, and in view of Dr. Švácha's reputation and his physical frailty, they requested the authorities to show leniency. The story took a further twist after the petition had been circulated. A message, reportedly sent by Dr. Švácha from prison, stated that there was no need to look for reasons and excuses why he and Emil Kuĉera collected specimens in the National Park, since they had never entered it.

During Dr. Švácha's custody, he was evidently looking forward to the opportunity to argue that he and his companion had not broken any law. The case was, however delayed by a strike of court staff. A court hearing eventually took place, at which Dr. Švácha was found guilty and fined the equivalent of 240 pounds sterling. The outcome was far worse for Mr Kuĉera, who was sentenced to three years in jail and fined the equivalent of 720 pounds sterling. It seems also that their equipment was confiscated. There is, however, a report that Mr Kuĉera was allowed bail, pending an appeal.

There have been various cases in which *bona fide* naturalists, when venturing abroad, have fallen foul of laws that are perhaps designed to deter commercial collectors. In order to help avoid such occurrences, it nowadays seems advisable for travellers to operate under the good offices of a member of a *bona fide* institute in the country concerned. This should help to ensure that no suspicion is brought to bear on travellers. Such a liaison is, however, not always available to everyone and might seem inappropriate in certain circumstances; for example, when naturalists are abroad mainly for other purposes (e.g. family holidays or conferences) and would like to collect specimens informally if the opportunity arises. In Dr. Švácha's case, officials reportedly commented that he ought to have made arrangements with an Indian colleague, rather than trying to collect specimens while visiting the country as a tourist.

The arrests and the ensuing results of the court hearing have caused concern amongst naturalists and other invertebrate biologists. A few of the signatories to the petition have criticised countries with draconian laws, which criminalise essentially law-abiding people for activities that are not harmful to wildlife. The onus is, however, on individual collectors to endeavour to find out which laws exist and to obey them.

In this context, British field workers ought to be aware that there are sites in Britain (including numerous Sites of Special Scientific Interest) at which collecting any invertebrate without a permit is a punishable offence. Such potential for prosecution under these site-related provisions might surprise many field biologists, since there is a general perception that the UK's laws regarding the collection of invertebrates are moderate and discriminating.

Any governments that are planning to introduce laws to protect species would do well to study the Invertebrate Link document "*Statement on the appropriate role of legislation in controlling activities likely to harm specified taxa of terrestrial and freshwater invertebrates, with particular reference to taking and killing*" (see *ICN* 56). The statement, which is shortly to be published formally in the *British Journal of Entomology and Natural History*, sets out a rational basis for selecting species for legal protection.

SITES AND SPECIES OF INTEREST

Crucifix ground beetle in eastern England

The Crucifix Ground beetle *Panagaeus cruxmajor* is one of the rarest ground beetles in the UK. It has distinctive bright red markings on a black background and it is used as a colourful 'flagship species' to publicise dune and flood meadow wetland conservation and to popularise ground beetle conservation. In the UK, it is listed as an Endangered Red Data Book species and is also a Biodiversity Action Plan Priority Species. It was considered a great prize by Victorian entomologists but it was reasonably widespread during the nineteenth and early twentieth centuries. It later became confined to only a few sites, apparently because of the development of scrub or coarse grassland on its areas of habitat, which are grazed wet pastures or dune slacks.

After 1951, *P. cruxmajor* was found only at three UK sites; in flood meadows in the Lower Derwent Valley in Yorkshire, and in dune systems at Tywyn Burrows in Dyfed and Saltfleet-by-Theddlethorpe in Lincolnshire. Until then, it had been found with decreasing frequency also at Wicken Fen in Cambridgeshire, which had previously been one of its strongholds. The news is that it has been recently re-discovered at Wicken Fen, by Stuart Warrington, a National Trust Conservation

Adviser. This discovery comes as a welcome surprise, since other entomologists, including the coleopterist Tony Drane, had searched for the beetle at Wicken Fen over many years without success. Tony Drane is quoted as saying that the species has probably survived undetected in low numbers in the Fen alongside Wicken Lode. He points out that it is one of a number of rare species in decline across the UK which survive at Wicken Fen and which show the importance of this nature reserve and the need to enlarge the reserve.

Citrus longhorn beetle alert in UK

As mentioned in *ICN* 28, the 'Asian longhorn beetle' *Anoplophora glabripennis* has become a serious pest in parts of the world where it has been accidentally introduced. Its larvae burrow in the previously sound wood of various tree species, eventually weakening branches so much that mechanical failure can occur. Eradication measures include the felling and burning of mature trees, partly to reduce risk to people and property and partly to help reduce the spread of the beetle. As a result, many thousands of affected trees have been cut down in the USA and elsewhere (e.g. the Lombardia region of Italy).

The loss of trees is of serious concern in relation to the conservation of other invertebrates that depend on trees for their habitats. It would be of particular concern if ancient trees were to become involved, since they often have exceptional value for biodiversity.

As far as the UK is concerned, both *A. glabripennis* and the similar *A. chinensis* (the Citrus longhorn beetle; see *ICN* 49) are designated as quarantine pests. The chances of the latter becoming permanently established in the UK are, however, probably smaller, as it is favoured by a warmer climate. This designation is intended to prevent the importation of trees or timber products that harbour these beetles. In recent years, however, both species have been discovered in the UK at nurseries, at the premises of bonsai importers and in private gardens, where trees have been received from east Asian exporters.

Unfortunately, a potentially major importation of *A. chinensis* seems to have occurred recently in the UK. This has involved plants of Japanese maple *Acer palmatum*, imported from China via the Netherlands and distributed by mail order. Previous sightings of *Anoplophora* spp. in the UK have been linked mainly to wooden packing materials, unconnected with the horticultural trade, but the recent importation of *A. chinensis* is one of several reported to have involved plants of maple species, especially *Acer palmatum* and Trident maple *A. buergerianum*. Imported bonsai apple trees (*Malus* spp.) have also been a source.

In addition to maples, apples and *Citrus* spp, many other kinds of tree and shrub are suitable hosts for *A. chinensis*, including ash, beech, birch, hawthorn, hazel, hibiscus, hornbeam, horse chestnut, mulberry, oak, pear, plane, poplar, rose and willow.

So far, neither *A. glabripennis* nor *A. chinensis* are known to have become established in Great Britain, despite recent findings of the latter in Gloucestershire. Since, however, the current case involves a potentially large number of mail order customers, it could be more difficult to trace than the previous cases. Anyone who sees these beetles in the UK is requested to trap them if possible and to notify the local Plant Health and Seeds Inspector, whose contact details can be found on the DEFRA website – http://www.defra.gov.uk/planth/senior.htm or telephone 01904 455174.

The two species are both large and distinctively patterned (21-37 mm long, with variable white markings on a black background) and are therefore unlikely to be mistaken for any native longhorn beetle. In *A. chinensis*, the pale markings are sometimes bluish, rather than white. While larva or pupae remain in the wood of the tree, there are no very obvious signs of infestation. Their emergence holes, are large (6-11 mm in diameter) but are sometimes below or just above ground level and can therefore be overlooked. Other signs are less distinctive (i.e. sawdust-like frass, adult feeding damage on foliage petioles, scraped areas of bark and oviposition slits in the bark); these indicate a need to examine the base of the tree for the possible presence of the large emergence holes.

Images of the beetles can be found on the Plant Health section of the DEFRA website, www.defra.gov.uk/planth/phindx.htm or at: www.eppo.org/QUARANTINE/insects/Anoplophora_malasiaca/ANOLMA_images.htm.

Zebra mussel in the UK

The Zebra mussel *Driessena polymorpha*, a native of freshwater areas around the Black Sea and the Caspian Sea, is a small black and white striped freshwater bivalve, reaching up to 5 cm in length, which feeds by filtering plankton from the surrounding water. It persists in waters that are high in calcium and where the pH is greater than 7.5. It can tolerate low salinity and reproduces best in water temperatures between 17 and 25°C.

It is an invasive species in the UK and is now placed in a high-risk category in areas such as the eastern English county of Essex, having become increasingly widespread and abundant since about the year 2000 (Aldridge *et al.*, 2004). Although its rise in prevalence is recent, it

was recorded in England as long ago as 1824, having been introduced with imported timber. It was then spreading across much of Europe after the building of canals.

The Zebra mussel can threaten populations of native freshwater bivalves and other filter feeders through competition for food in rivers, canals and lakes. It sometimes forms very abundant colonies (containing up to 100,000 individuals per square metre), which can smother native freshwater bivalves, such the Depressed river mussel *Pseudanodonta complanata*, which is a UK Biodiversity Action Plan Priority species. Fish populations can also be affected, not only because Zebra mussel colonies compete with juvenile fish for food, but also because they increase the clarity of the water by filtration, thus favouring predators of the fish.

In addition to the threats that Zebra mussels pose to native aquatic fauna and flora, there are economic impacts. Dense colonies can clog intake-pipes, drains and screens in installations such as power plants, fish hatcheries and waterworks. These problems have necessitated the use of expensive filtration or sterilisation systems, in some cases involving chemical control with chlorine. The use of chlorine is environmentally undesirable, especially since the mussels close their shells in response to the chlorine and can then be killed only by prolonged contact. The mussels can, however be killed by concentrations of salt below the level which would stimulate defensive closure of the shell. Using this principle, a control method has been developed so as to kill them without harming most other forms of aquatic life.

In dense colonies, the mussels become very firmly attached to surfaces by bundles of fibrous, tough strands (the byssus) which they secrete. This helps to protect them against predation which, at lower densities, can usefully be effected by animals such as fish, crayfish, coot and tufted ducks.

In an effort to help prevent the further spread of the Zebra mussel through British water bodies, the Environment Agency is giving advice to anglers, boat users, and sampling staff. Also, members of the public are encouraged to report new findings to the Environment Agency, tel: 08708 506 506, e-mail enquiries@environment-agency.gov.uk

Reference

Aldridge, D.C., Elliott, P. and Moggridge, G.D. (2004). The recent and rapid spread of the zebra mussel (*Dreissena polymorpha*) in Great Britain. *Biological Conservation* **199**, 253-261.

RESEARCH NOTES

Threats to corals in relation to 'climate engineering'

In 2004, a report entitled *Coral Reefs & Global Climate Change: Potential Contributions of Climate Change to Stresses on Coral Reef Ecosystems*, was published by the Pew Center in the USA. The report stressed that coral reefs are among the most biologically diverse ecosystems on Earth, providing vital habitat to numerous species as well as economic benefits to society in the form of fishing and tourism. The authors, Joan Kleypas and Robert Buddenheimer, warned that corals are being harmed not only by increasingly high temperatures, but also by the increasing concentration of dissolved CO_2, which makes the water more acid and thus inhibits the ability of the corals and associated organisms to accrete calcium carbonate for reef formation. This problem is adding to the other factors that are harming coral reefs.

Corals and other calcifying organisms, such as coccolithophores, can flourish in relatively shallow, warm waters, where calcium carbonate ($CaCO_3$) is readily precipitated to form shells and skeletons. This process is inhibited beyond a certain depth, at which the combination of lower temperature and higher pressure makes $CaCO_3$ more soluble. Reef formation is restricted to increasingly shallow waters if an increased concentration of dissolved CO_2 makes the water more acid. On the other hand, an increase in temperature has the opposite effect, and so the combined effects of CO_2 as a greenhouse gas and as an acidifier are complex.

Following the Pew report, further research has revealed that coral reefs could be affected more severely by acidification than was previously thought. This is because reef formation depends not only on the corals themselves but also on associated crustose coralline algae, which appear to be more sensitive than the corals. (Kuffner *et al.*, 2008). Not only do these algae contribute to the accumulation of $CaCO_3$; they also help the cementation of otherwise loose coral fragments and they provide niches for the settlement of coral larvae.

The research involved the experimental rearing of reef organisms in outdoor tanks of seawater, while testing the effects of acidifying the water to the level which the Intergovernmental Panel on Climate Change has predicted for the year 2100. The result was a 92% decrease in the area which the crustose coralline algae covered in the tanks. The area covered by non-calcifying fleshy algae increased by 52%. The same might not happen in coral reefs, where more complex interactions between organisms operate, but the study provides a stark warning of possible things to come.

Since the medium-term prospects for controlling greenhouse gas emissions do not look good, various campaigners have advocated schemes for removing CO_2 from the atmosphere. One such scheme would involve fertilising seawater with iron, which exists at very low natural concentrations in extensive parts of the oceans. The iron would stimulate algal photosynthesis, thus increasing the uptake of CO_2 from the atmosphere. The increased algal biomass would provide an enhanced habitat for calcifying organisms, which should in principle lock up the carbon as $CaCO_3$, which can eventually become incorporated into limestone and other sedimentary rocks.

Advocates of ocean fertilisation point out that it occurs naturally due to deposition of volcanic dust. The eruption of Mount Pinatubo in the Philippines in 1991 is estimated to have deposited 40,000 tonnes of iron-containing minerals into the world's oceans. This is said to have accounted for a temporary decline in the concentration of atmospheric carbon dioxide, due to uptake by an enhanced population of algae and other organisms. On the other hand, there are concerns that fertilisation could cause major problems, such as the stimulation of toxic algal blooms. Due to complex processes, there could even be an increased rate of ocean acidification which would make matters worse, rather than better, for corals and their dependent organisms.

Reference

Kuffner, I.B., Andersson, A.J., Jokiel, P.L., Rodgers, K.S., and Mackenzie, F.T., (2008). Decreased abundance of crustose coralline algae due to ocean acidification. *Nature Geoscience* **1**, 114-117.

Brownfield studies in the Czech Republic

Naturalists in the UK have long been aware of the value of old quarries for invertebrates and other wildlife. They provide a range of habitats which are elsewhere associated with features such as soft rock cliffs. These habitats are destroyed if, as often happens, the land is 'restored' to some other use. It is interesting to see some new research data from the Czech Republic, which provide support for the conservation of habitats in quarries, while also providing an international perspective on brownfield issues.

The authors, based at the University of South Bohemia, and at the Institute of Entomology, Czech Academy of Sciences, cite other studies that have been undertaken in limestone quarries in relatively warm regions, showing evidence that such sites can harbour a substantial proportion of species diversity formerly associated with traditional rural

landscapes. Their study involved quarries with an acidic substrate in a relatively cool upland climate. Using pitfall traps, they surveyed the spider fauna in three quarries in a piedmont region in the south west of the Czech Republic. They found more species per trap in adjoining semi-natural sites, but the traps in the quarries contained just as many endangered species. Also, there were certain endangered species that were found in the quarries only.

Generally, the quarries contained species that prefer lighter and more open vegetation and that are regarded as specialist pioneers of early successional habitats, which are increasingly rare in modern landscapes. On average, the 'quarry specialist' species had more restricted distributions in the Czech Republic than those found outside the quarries. The authors suggest that, in order to conserve such species, quarries should be allowed to undergo a natural succession, rather than being reclaimed by engineering.

Reference

Tropek, R. & Konvicka, M. (2007). Can quarries supplement rare xeric habitats in a piedmont region? Spiders of the Blansky les Mts., Czech Republic. *Land Degradation & Development*, **19**, 104-114.

PAST UK MEETINGS

Royal Entomological Society: Annual Meeting, Plymouth, 2-5 September

Dafydd Lewis, a member of the AES Conservation Committee, presented a poster at the 2008 annual meeting of the Royal Entomological Society. The poster was entitled *"Joined-up entomology – working together for insect conservation and the next generation of entomologists"* and was thus in the spirit of the conference held by Invertebrate Link in London in November 2006. The poster showed how the AES is working to encourage new generations in various ways, including work with affiliated societies and collaborative events for young entomologists at venues such as the London Natural History Museum, National Trust properties and the Royal Horticultural Society's Garden at Wisley.

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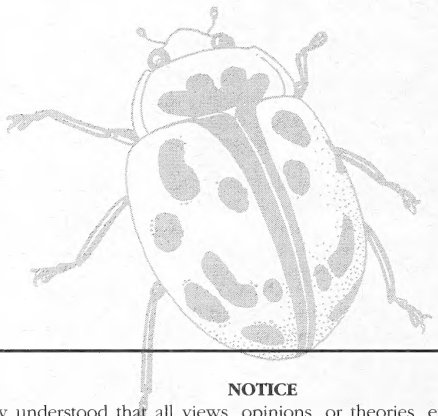

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