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The Biodiversity Action Plan (BAP) for *Niphargus glenniei* (Crustacea: Amphipoda: Niphargidae): the first British troglobite to be listed.

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Abstract: The cave shrimp *Niphargus glenniei* (Spooner, 1952) has recently been placed on the UK Biodiversity Action Plan (BAP) list of priority species. This represents the first aquatic hypogean taxon to be given conservation status/recognition in the UK. This paper outlines the selection procedure and the conservation actions required for the species in the future.

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INTRODUCTION

The genus *Niphargus* includes many species of small, eyeless, unpigmented crustaceans, known colloquially as "well shrimps" or "cave shrimps". Most of these species inhabit subterranean waters and have been recorded from pools, streams and lakes in caves; wells and boreholes; springs; and from amongst interstitial gravels in river systems (Karaman and Ruffo, 1986; Gledhill *et al.*, 1993; www.freshwaterlife.org/hcrs).

The genus is known from the Palaearctic region west of the Caspian Sea. It is thought that diversification and specialisation within the genus began in the basins of the Paratethys Sea during the Tertiary Period, from which European fresh waters were subsequently colonised via brackish subterranean waters (Ruffo, 1956; Karaman and Ruffo, 1986) This is supported by the fact that the largest number of taxa, and those most differentiated morphologically and ecologically, are found in the Danubian – Carpathian region and the northern region of the Balkan Peninsula. There is a reduction in the number of taxa with distance from this area. Of the 252 taxa included in genus *Niphargus*, only 5% inhabit surface waters, including the beds of lakes (Karaman and Ruffo, 1986).

Niphargus species are generally considered to be saprophagous, living on plant and animal detritus, much of which is washed into the subterranean habitat from surface ecosystems. There is some evidence to suggest that larger specimens are predaceous on other invertebrates, including juvenile niphargids. Due to the scarcity of food in hypogean habitats it is likely that they are opportunistic feeders, eating whatever they encounter. Silt and clay, with its associated bacteria and fungi are also thought to form part of the diet, especially in the European species *Niphargus rhenorhodanensis* (Gibert, 1986).

Within Britain and Ireland six species of *Niphargus* are currently known. *Niphargus aquilex* (Schiødte, 1855) is the most common and widely distributed, occurring to the south of a line from the River Humber estuary to the River Dee estuary (on the Welsh Border), with a few outlying records to the north. *Niphargus fontanus* (Bate, 1859) has been recorded from southern England and Wales, although it is absent from Devon and Cornwall. It is the species most likely to be seen in Welsh and Mendip caves. *Niphargus kochianus kochinanus* (Bate, 1859) is known from wells and boreholes in southern England and has been recorded rarely from caves. Ireland has two endemic niphargids; *Niphargus kochianus irlandicus* (Schellenberg, 1932), which is widespread in groundwater and caves across the country; and *Niphargus wexfordensis* (Karaman, Gledhill and Holmes, 1994), which until recently was known from a single well in County Wexford. Current research indicates that this species is also widespread across the south of Ireland, although it is less common than *N. kochianus irlandicus* (Knight and Penk, 2008; Arnscheidt *et al*. 2009).

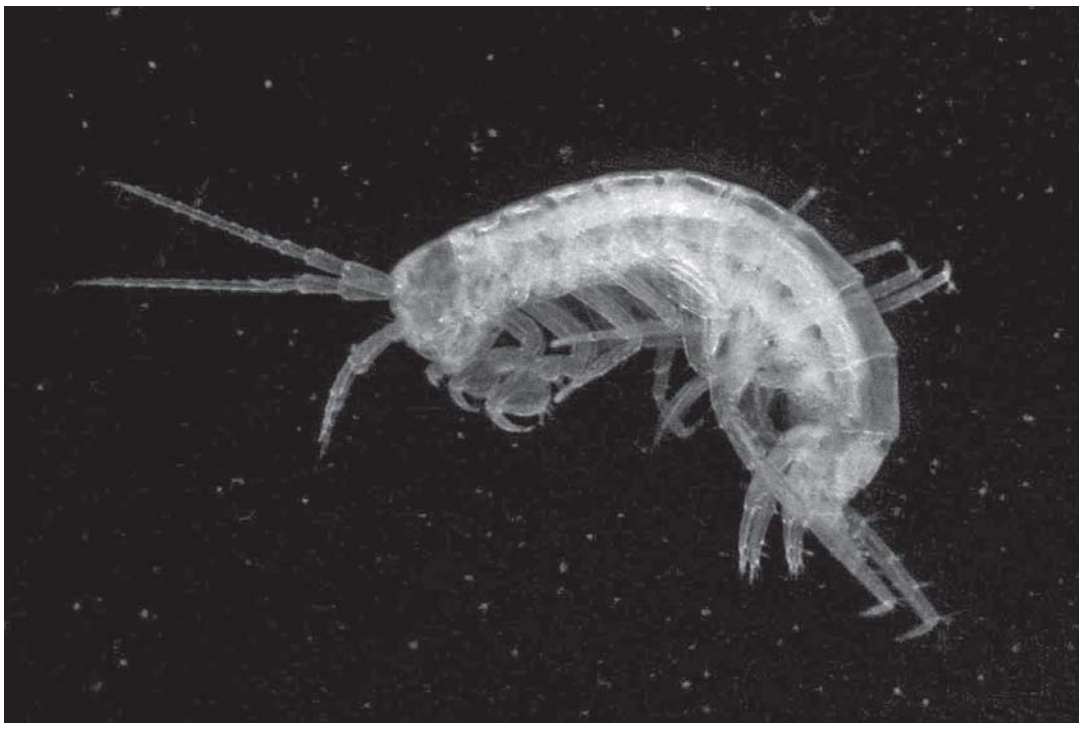

Figure 1: Niphargus glenniei, *a specimen collected from Fishcombe Quarry Cave, Brixham, Devon. (Photo courtesy of Chris Proctor).*

Vice-County	Grid Ref.	Date	Location
West Cornwall (1)	SW 3795 2869	27/02/2001	Disused well at Brea Downs
West Cornwall (1)	SW 4051 2921	Nov 2000	Well at Caer Bran Farm, Grumbla, near Sancreed
West Cornwall (1)	SW 4051 2921	25/2/2001	Well at Caer Bran Farm, Grumbla, near Sancreed
West Cornwall (1)	SW 6813 3193	08/07/2003	Well near Chenhall Farm, beside B3297
West Cornwall (1)	SW 7758 3606	12/03/2002	Well near Treluswell Mount
South Devon (3)	SX 52 73	03/05/1960	Two springs near Moortown
South Devon (3)	SX 554 645	15/05/1969	Interstitial gravel beds beside River Plym, Cadover Bridge
South Devon (3)	SX 557 646	27/05/1960	Interstitial gravel beds beside River Plym, Cadover Bridge
South Devon (3)	SX 674 579	May-60	Well at Moorgate, Wrangaton, near South Brent
South Devon (3)	SX 735 652	09/10/2001	Bunkers Hole
South Devon (3)	SX 735 652	21/07/1998	Shakey Hole
South Devon (3)	SX 7420 6649	1956	Baker's Pit
South Devon (3)	SX 7420 6649	02/06/1956	Baker's Pit
South Devon (3)	SX 7420 6649	05/09/1968	Baker's Pit
South Devon (3)	SX 7420 6649	12/05/1991	Baker's Pit
South Devon (3)	SX 7420 6649	13/01/1998	Bakers Pit
South Devon (3)	SX 7430 6647	26/02/1961	Rift Cave
South Devon (3)	SX 7430 6647	21/07/1963	Rift Cave
South Devon (3)	SX 7430 6647	16/05/1964	Rift Cave
South Devon (3)	SX 7430 6647	07/06/1969	Rift Cave
South Devon (3)	SX 7430 6647	12/05/1991	Rift Cave
South Devon (3)	SX 7430 6647	15/07/1999	Rift Cave
South Devon (3)	SX 7432 6653	08/01/1949	Reed's Cave
South Devon (3)	SX 7432 6653	11/03/1951	Reed's Cave
South Devon (3)	SX 7432 6653	03/06/1956	Reed's Cave
South Devon (3)	SX 7432 6653	26/02/1961	Reed's Cave
South Devon (3)	SX 7432 6653	18/05/1964	Reed's Cave
South Devon (3)	SX 7432 6653	05/09/1968	Reed's Cave
South Devon (3)	SX 7432 6653	25/05/1969	Reed's Cave
South Devon (3)	SX 7432 6653	07/06/1969	Reed's Cave
South Devon (3)	SX 7432 6653	13/07/1999	Reed's Cave
South Devon (3)	SX 7432 6653	22/06/2005	Reed's Cave
South Devon (3)	SX 749 631	07/04/1972	Bulkamore Iron Mine
South Devon (3)	SX 749 631	29/12/1998	Bulkamore Iron Mine
South Devon (3)	SX 7487 6790	17/04/1998	Little Prid
South Devon (3)	SX 7487 6790	19/04/1948	Pridhamsleigh Cavern
South Devon (3)	SX 7487 6790	17/05/1948	Pridhamsleigh Cavern
South Devon (3)	SX 7487 6790	11/10/1948	Pridhamsleigh Cavern
South Devon (3)	SX 7487 6790	31/10/1948	Pridhamsleigh Cavern
South Devon (3)	SX 7487 6790	21/11/1948	Pridhamsleigh Cavern
South Devon (3)	SX 7487 6790	29/12/1948	Pridhamsleigh Cavern
South Devon (3)	SX 7487 6790	08/01/1949	Pridhamsleigh Cavern
South Devon (3)	SX 7487 6790	19/03/1961	Pridhamsleigh Cavern
South Devon (3)	SX 7487 6790	09/02/1998	Pridhamsleigh Cavern
South Devon (3)	SX 7487 6790	03/11/2003	Pridhamsleigh Cavern
South Devon (3)	SX 753 715	07/04/1969	Boro Wood Adit, Near Ashburton
South Devon (3)	SX 762 666	25/10/1970	Pen Recca Slate Mine
South Devon (3)	SX 762 666	18/06/2000	Pen Recca Slate Mine
South Devon (3)	SX 762 666	22/01/2006	Pen Recca Slate Mine
South Devon (3)	SX 774 772	21/05/1969	Haytor Iron Mine, Haytor Vale
South Devon (3)	SX 774 772	25/05/1969	Haytor Iron Mine, Haytor Vale
South Devon (3)	SX 774 772	07/06/1969	Haytor Iron Mine, Haytor Vale
South Devon (3)	SX 774 772	25/09/2000	Haytor Iron Mine, Haytor Vale
South Devon (3)	SX 8384 6321	26/12/1971	Afton Red Rift
South Devon (3)	SX 8384 6321	05/05/1998	Afton Red Rift
South Devon (3)	SX 8384 6321	23/09/2002	Afton Red Rift
South Devon (3)	SX 8384 6321	03/06/2003	Afton Red Rift
South Devon (3)	SX 8384 6321	28/07/2004	Afton Red Rift
South Devon (3)	SX 8384 6321	27/06/2005	Afton Red Rift
South Devon (3)	SX 8384 6321	26/10/2005	Afton Red Rift
South Devon (3)	SX 8663 7864	29/01/1999	Clifffords Cave, near Chudleigh Rocks
South Devon (3)	SX 8663 7864	07/11/2002	Clifffords Cave, near Chudleigh Rocks
South Devon (3)	SX 9158 8210	13/05/2007	Spring at North Kenwood Farm
South Devon (3)	SX 9158 8210	13/08/2008	Spring at North Kenwood Farm
South Devon (3)	SX 9227 5676	11/04/2003	Fishcombe Quarry Cave, Brixham
South Devon (3)	SX 9227 5676	02/01/2005	Fishcombe Quarry Cave, Brixham
South Devon (3)	SX 9227 5676	29/05/2005	Fishcombe Quarry Cave, Brixham
South Devon (3)	SX 9227 5676	27/11/2005	Fishcombe Quarry Cave, Brixham
South Devon (3)	SX 9227 5676	05/03/2006	Fishcombe Quarry Cave, Brixham
South Devon (3)	SX 9250 5645	29/11/1998	Cloleman's Maze, Brixham
South Devon (3)	SX 9342 6413	21/02/2001	Kent's Cavern, Torquay
North Devon (4)	SS 562 475	1956	Napps Cave
North Devon (4)	SS 562 475	10/10/1965	Napps Cave
North Devon (4)	SS 562 475	15/08/1998	Napps Cave

Table 1: *Records for* Niphargus glenniei. *(full data are available from the Hypogean Crustacea Recording Scheme at www.freshwaterlife.org/hcrs).*

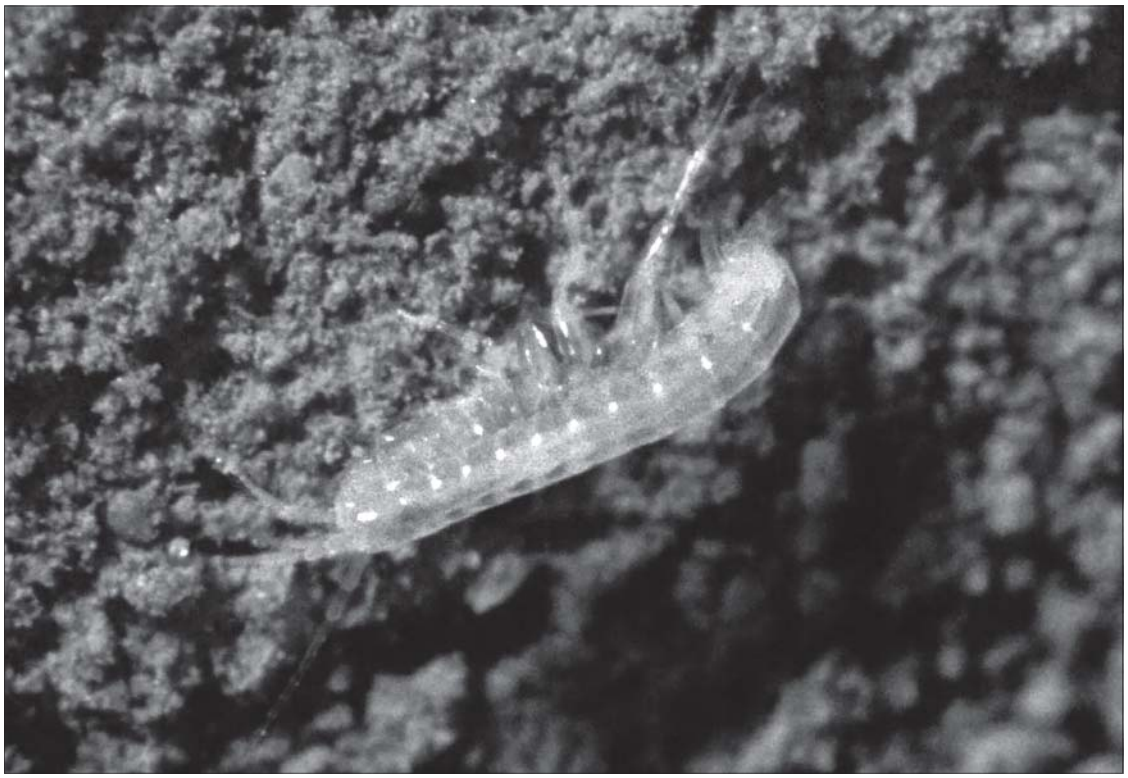

Figure 2*:* Niphargus glenniei *in a pool in Easter Chamber, Reed's Cavern, Buckfastleigh, Devon. (Photo courtesy of Chris Proctor).*

Niphargus glenniei (Spooner, 1952) was first discovered in Pridhamsleigh Cavern, near Buckfastleigh, Devon in 1948 by E A Glennie and Mary Hazelton. The first specimens were examined by G M Spooner of the Marine Biological Association and described as a new species, named after Glennie (see Figure 1).

There are several morphological differences in *Niphargus glenniei* that place it apart from the other British *Niphargus* species. These include its small size (the average size being 3mm, as opposed to 8 to 15mm for other British *Niphargus*), the form of the telson and uropods and the setation of article 3 of the mandible palp. This latter feature in particular, meant that *Niphargus glenniei* was formerly placed in the genus *Niphargellus*. See Gledhill *et al*. (1993), Spooner (1952) and Karaman *et al*. (1994) for discussions on the validity of the genus *Niphargellus*.

The small body size and lateral flattening of the body (see Figure 2) mean that *Niphargus glenniei* is well adapted to living in phreatic groundwater within subterranean fissures and strata. This is believed to be the primary habitat of the species and it may occasionally be washed out into caves and mines after heavy rain. If conditions are suitable within a cave, it will form semi-permanent / permanent populations there, but if there is too much disturbance, or a lack of food then it will migrate back into fissures within the surrounding rock.

N. glenniei is endemic to Devon and Cornwall and is one of only a very few UK endemic faunal species. *Niphargus aquilex* is the only other niphargid known to occur in this region. The species was given a Red Data Book K and 5 (Insufficiently Known and Endemic) conservation status by Bratton (1992).

Within Devon it has been recorded from Napps Cave, near Berrynarbor in the north of the county but most records are in the south. These records include a spring issuing through metamorphosed slate at Moortown, near Tavistock; a spring-fed well in the Haldon Hills; superficial riverine gravels in a spit on the upper reaches of the River Plym; several mines; and a well at Moorgate. Most of the records are from caves, with recent (post 1998) discoveries in the Chudleigh, Torquay and Brixham Devonian limestone outcrops. In 2000, *N. glenniei* was discovered in a well in granite near Land's End and recent investigations have found the species at three other wells in West Cornwall, as far east as Falmouth (Knight 2001). It is very likely that *N. glenniei* is widespread in the

Figure 3: *Current distribution of* Niphargus glenniei *in Devon and Cornwall. Black dots represent recent records (1998 onwards) from new and historic sampling sites, open circles represent pre-1970 records.*

Ref. no. *(Office use)*			**Date of submission**		15 / 02 / 05	
Species' name	*Niphargus glenniei* Spooner 1952					
Order and family	Amphipoda Niphargidae					
Checklist used	Proudlove, G.S. (2002) 'A Preliminary list of the obligate subterranean fauna of the British Isles.' BCRA (British Cave Research Association) web page (www.bcra.org.uk)					
Contributor's name	Lee Knight					
Affiliation	National Recorder for hypogean macro-Crustacea					
Contact no./address	lee.knight@talk21.com					
Consultee(s)	Graham Proudlove	Paul Wood		Terence Gledhill		
Affiliation(s)	BCRA	Loughborough University		Freshwater Biological Association		
UK distribution	Devon and West Cornwall					
Population size	Population size not known. Recorded from 19 sites in Devon (between 1948 and 2004) and 4 in West Cornwall (2000 – 2003)					
Current UK/GB status	RDBK RDB5 (Bratton, 1991)					
Existing BAP priority	**Yes**		**No X**			
CRITERION 1 International threat	**Global threat**	Endemic to South West England				
	European threat	Endemic to South West England				
	Supporting/ additional information	Not known outside Devon & Cornwall				
CRITERION 2 International responsibility + decline in UK	**a) UK population**	**% of global pop.**	100	**% of European pop.**	100	
	Supporting/ additional information	Endemic to the aquatic hypogean environment of Devon and West Cornwall. Recorded from 19 sites (10 10km squares) in South Devon, 1 site in North Devon and 4 sites (4 10km squares) in West Cornwall				
	b) Decline	**%**		**No. of yrs.**		**Dates**
	Supporting/ additional information	Does not appear to have declined. Difficult to assess due to cryptic habitat and difficulties in sampling population. Has recently been confirmed at most sites it was previously known from and discovered at several new sites in the last 6 years.				
CRITERION 3 Marked decline in UK	**Decline**	**%**		**No. of yrs.**		**Dates**
	Supporting/ additional information	See information above.				
CRITERION 4 Other important factor(s)	Although the species does not appear to have declined, it should be considered for inclusion due to its limited global distribution					
Data and information	**Source(s)**	BRC recording scheme for hypogean macro-Crustacea. BCRA biological records. Bratton, J.H. (1991) 'British Red Data Books: 3 invertebrates other than insects.' JNCC Peterborough Gledhill, T. et al. (1993) 'British freshwater Crustacea Malacostraca: a key with ecological notes.' *FBA Scientific Publication, No.52* Glennie, E.A. (1967) 'The distribution of the hypogean Amphipoda in Britain.' *Transactions of the Cave Research Group of Great Britain, Vol. 9, p132-136* Knight, L.R. (1999) 'The hypogean Crustacea of Devon.' *Journal of the Devon Spelaeological Society, Vol. 156, p20-25* Knight, L.R. (2001) 'The occurrence of *Niphargus glenniei* (Crustacea : Amphipoda: Niphargidae) in West Cornwall, *UK' Cave & Karst Science, Vol.28, No.1, p45-46* Proudlove, G.S. et al. (2003) 'A review of the status and distribution of the subterranean aquatic Crustacea of Britain and Ireland' *Cave & Karst Science, Vol. 30, No.2, p53-74* Spooner, G.M. (1952) 'A new subterranean gammarid (Crustacea) from Britain' *Proceedings of the Zoological Society, London, Vol. 121, p851-859*					
	Quality	Existing information is reliable. BRC recording scheme data and BCRA biological records used. Ecological information on the species is minimal				
	Gaps	Further recording efforts required in East Cornwall, mid / North Devon, The Isles of Scilly and the western borders of Dorset and Somerset. Ecological information				
Criteria satisfied	**1**	**Yes**	**No X**	**Unknown**		
	2	**Yes**	**No**	**Unknown X**		
	3	**Yes**	**No**	**Unknown X**		
	4	**Yes X (Possibly)**	**No**	**Unknown**		
Needs of species	**Main requirements**	Recorded from interstitial groundwater in gravels, wells and pools (mostly silt-lined and shallow) in caves and mines. Detailed requirements not known due to lack of autoecological knowledge				
	Priority habitat(s)	Interstitial groundwater				
Threats to species	Pollution of groundwaters and over-abstraction from porous rock strata.					
Action required	Further recording required to fill in existing gaps in distribution Autoecological studies					
Comment	Species might be more widespread than currently known. The species' habitat is difficult to sample and therefore it is hard to assess whole populations and carry out ecological studies. The recent discovery of *N. glenniei* in West Cornwall and the fairly recent (1980) discovery of a *Niphargus* species new to science in southern Ireland highlight the lack of distributional knowledge of this group.					

***Table 2**: Information submitted to Stage 1 of the Biodiversity Action Plan (BAP) review process to support the inclusion of* Niphargus glenniei *on the new BAP list of priority species.*

phreatic groundwater between West Cornwall and the Devon border. Table 1 lists the known sites from which *Niphargus glenniei* has been recorded and the locations are presented in Figure 3.

N. glenniei has recently been placed on the UK Biodiversity Action Plan (UK BAP) list of priority species. With the exception of bats, which are all included on the UK BAP list, this is the only other UK species associated with caves to be placed on the list and is currently the only stygobite (obligative dweller in subterranean

aquatic habitats) or troglobite (obligative dweller in caves). Currently the troglobitic spider *Porrhomma rosenhaueri*, known only from a few caves in South Wales and the troglobitic springtail *Disparrhopalites patrizi*, known only from one cave in Devon, have been omitted from the Biodiversity Action Plan list, although the former does have Red Data Book status. In addition to the UK BAP, *N. glenniei* is also mentioned in the Torbay Local BAP, which includes three of the caves where it has been recorded and in the Devon Local Habitat Plan on caves, karst and mines.

THE UK BIODIVERSITY ACTION PLAN

The Convention on Biodiversity was signed by the UK government in 1992 at the Earth Summit in Rio de Janeiro. The convention has three goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources. In April 2002 the parties of the convention committed themselves *"… to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth"*.

The UK BAP, which is the UK government's response to the Convention on Biodiversity, describes the UK's biological resources and commits a detailed plan for the protection of these resources (http://www.ukbap.org.uk). A list of priority species and habitats was published in 1995 – 1998, containing 391 Species Action Plans (SAP), 45 Habitat Action Plans (HAP) and 162 Local Biodiversity Plans, with targeted actions. *N. glenniei* was not included within any of these first lists.

The UK Biodiversity Partnership replaced the UK Biodiversity Group in 2002, following the government's response to the Millennium Biodiversity Report (Department of the Environment, Transport and the Regions, 2001). This had the action of bringing together all the partners involved in, or with an interest in, the UK BAP and in policy on biodiversity, and to co-ordinate action that should be taken forward at the UK level. The partnership consists of a wide range of people, from those who provide funds, amateur and professional experts, to those who are interested in the rich wildlife and natural history of the UK. They include private individuals, business, and government and non-government representatives.

The UK Biodiversity Reporting and Information Group (BRIG) was given the task of reviewing the list of priority species and habitats during 2005 and 2006. As part of the process, a UK BAP Invertebrate Review Group was established by Invertebrate Link, to undertake the first stage of the review for non-marine invertebrates. Buglife (the Invertebrate Conservation Trust) was contracted to co-ordinate the initial review and to assist experts with their contributions. The review consisted of three stages: the scientific assessment of conservation status; the determination of species and habitat delivery mechanisms; and the drawing up of species and habitat action plans (http://www.ukbap.org.uk).

The Priority Species and Habitats Review Working Group dealt with the initial planning and stage 1 work to select a UK BAP list of species and habitats. The Priorities Review Group then dealt with stage 2 work to 'signpost' species and habitats on this list, to identify types of action and consider the functions necessary to deliver that action. Species and habitats were selected through the application of criteria based on international importance, rapid decline and high risk. These criteria and their application were then further developed separately for marine biodiversity, terrestrial / freshwater species and terrestrial / freshwater habitats. For the terrestrial / freshwater species up to three priority actions and some additional supporting actions were identified by species experts and these were then 'signposted' for implementation by the Priorities Review Group.

CATEGORY	DEFINITION
Research	Identifies species for which the conservation actions are unknown and research is required to identify conservation management actions for the species
Gaps in surveillance and monitoring	Identifies species for which monitoring or surveillance is not currently available or is among the most important actions
Wider actions	Includes issues like pollution, climate change and policies such as planning regulation and European Directive obligations
Legal Protection	Actions relating to amendment to legislation such as the Wildlife and Countryside Act
UK BAP priority habitat expansion and condition	Links species and UK BAP habitats, where specific habitat action will help to conserve a species
Site specific action	Identifies where specific management needs to be improved at certain sites
Conservation management benefiting single species	Lists the action that is essential for the species but cannot be delivered by existing policies, habitat or site management measures

Table 3: *Categories of priority actions to be implemented for Biodiversity Action Plan species*

After two years work involving more than 500 people, the proposed UK list of priority species and habitats was presented in a UK BAP website report in June 2007. The new BAP list now contained 1149 species and 65 habitats. All habitats previously included were re-selected and 20 new ones added. Most species previously on the list were re-selected, with the exception of 123 that were excluded because their requirements had been met by previous actions. The Priorities Species and Habitat Review and the Priorities Review groups both recommended that the list be formally adopted and all four UK regional governments have now done so and have published the new UK list of priority species and habitats (http://www.ukbap.org.uk/). This list is an important reference source, bringing all the scientific information on UK BAP species and habitats together in one place. The final stage of the process, the drawing up of the individual species and habitat action plans is still in progress. A workshop involving specialists and researchers on the new BAP species and habitats took place in the autumn of 2008 to plan how best to take research needs forward.

THE SELECTION PROCESS FOR INCLUDING *Niphargus glenniei* IN THE NEW LIST OF BAP PRIORITY SPECIES

Stage 1 – Scientific Assessment of Conservation Status

All species and habitats placed on the initial list met agreed scientific criteria. The fundamental principles underlying the selection criteria were international importance, high risk or rapid decline and habitats

ACTION	BRIG CATEGORY
Further recording required to fill in existing gaps in distribution. The species` habitat is difficult to sample and therefore it is hard to assess whole populations and carry out ecological studies. The recent discovery of *N. glenniei* in West Cornwall and the fairly recent (1980) discovery of a *Niphargus* species new to science in southern Ireland highlight the lack of distributional knowledge of this group	Species-specific monitoring/survey
Prevention of pollution and over-abstraction of groundwater within Devon and Cornwall. Pollution is likely to occur via diffuse agricultural pathways. Over-abstraction is not likely to be a particular problem in the near future due to the high rainfall and relatively low population within the two counties.	Wider "landscape" action
Very little is known of the ecology of the species due to the difficulties mentioned above associated with its habitat. Further research is required on the subject, including how susceptible *N. glenniei* is to the effects of groundwater pollution	Species-specific research

Table 4: *Priority actions for* Niphargus glenniei *assigned by the Biodiversity Reporting and Information Group (BRIG).*

important for key species. The four scientific criteria used to select UK BAP terrestrial / freshwater species were: (1) international threat; (2) international responsibility and moderate decline in the UK; (3) marked decline in the UK; (4) other important factors (e.g. where quantitative data on decline are inadequate but there is convincing evidence of extreme threat; extremely limited geographical distribution; substantial threat to a food plant or highly specialised habitat if it is impossible to predict the resulting rate of decline in the species).

N. glenniei was selected under criterion 4, due to its very limited distribution (only known from Devon and Cornwall worldwide) and also the fact that very little is known about its ecology, population levels and the true extent of its distribution. Table 2 below details the information submitted for *N. glenniei* in Stage 1 of the BAP selection process. Note that an additional new site for the species was added in 2007, bringing the total in Devon to 20

Stage 2: Determination of Species and Habitat Delivery Mechanisms

For all species on the list, priority actions were identified by the expert and contact groups. These actions were grouped into broad categories (Table 3) and resulted in three priority actions for *Niphargus glenniei,* which were assigned by the BRIG (UK Biodiversity Reporting and Information Group) (Table 4).

Stage 3: Preparation of Individual Species and Habitats Action Plans

The final stage of the process of preparing the species action plan is still in progress. The wider "landscape" action will be taken forward by Natural England and the species-specific actions will be taken forward by a research group. The Joint Nature Conservancy Council (JNCC), along with the NGOs, is currently setting up a contract to get all the UK BAP research actions categorised into a format that will enable some form of plan to be made on how to deal with these research needs. Once the BAP research actions have been grouped, the contractor will set up a workshop of invited specialists and researchers to plan how best to take the research needs forward. This workshop took place in the autumn of 2008.

FURTHER INFORMATION

For more information on the UK BAP, the recent review and the new list of priority species and habitats see the UK BAP website at http://www.ukbap.org.uk/. Further information on the hypogean Crustacea of England and Ireland can be found on the website of the hypogean Crustacea recording scheme at www.freshwaterlife.org/hcrs. The website includes descriptions and photos of the British and Irish species, a downloadable file of species records and a link to the publication *'Cave Life in Britain'*. This booklet, which is available as a free download, describes the stygobitic fauna that can be found in British caves, including a simple key and identification notes to encourage biological recording amongst the caving community.

Whereas caves are not on the UK BAP list as a priority habitat, they are covered by the European Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora. JNCC has produced a report on the implementation of the directive from January 2001 to December 2006 and a section of this report details the cave habitat. This section is entitled 'Conservation Status Assessment for: H8310: Caves Not Open to the Public' and can be downloaded at http://www.jncc.gov.uk/artcle17. However, it should be noted that some of the biological information it contains is incorrect and requires updating, especially with regards to the known distribution of *N. glenniei* and the number of troglobitic / sygobitic taxa recorded in the UK.

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