

Proceedings of the Mongolian Biodiversity Databank Workshop: Assessing the Conservation Status of Mongolian Mammals and Fishes: I - Results and Outputs of the Workshop

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Abstract

The Mongolian Biodiversity Databank Workshop was held at the National University of Mongolia and Hustai National Park from 31st October to 4th November, 2005. Participants assessed the conservation status of all Mongolian mammals and fishes using the IUCN Categories and Criteria, and also met the other main objectives of the workshop, including: creating a Biodiversity Databank, revising species lists and maps for Mongolian mammals and fishes, and developing Summary Conservation Action Plans for a number of threatened or commercially important species. This article includes information about the IUCN Categories and Criteria used to assess Mongolian mammals and fish and these outputs. The Biodiversity Databank holds baseline data on the ecology, distribution, threats, conservation measures, and conservation status for all Mongolian mammals and fishes. Revised species lists have been agreed upon for the Biodiversity Databank project including 128 native species of mammals and 64 native species of fish. Digital maps have been produced for all mammals and fish, where data exists. Results of the workshop should provide baseline information for conservation of Mongolian biodiversity and provide resources for researchers.

Keywords: *biodiversity, databank, extinction risk, fish, mammal, Mongolia, threat*

Introduction

Mongolia's economy and landscape have undergone rapid changes since the early 1990s, but the impact of these changes on the conservation status of Mongolian wildlife has been poorly documented. From October 31st to November 4th 2005, over 70 of the world's leading Mongolian biodiversity specialists participated in the first Mongolian Biodiversity Databank Workshop to identify the conservation status of Mongolian species, and thus form a baseline from which future trends can be measured. Included in the Workshop was a small expert working group focussing on Mongolian fishes. The main objectives of the meeting were to develop an agreed species list for Mongolian mammals and fishes, populate the Mongolian Biodiversity Databank, develop detailed distribution maps for all Mongolian mammals and fish, assess the conservation status of Mongolian mammals and fishes and identify measures necessary to conserve species of concern. This paper highlights the main findings of the workshop, with more detailed discussion of the status of and threats to Mongolian mammals and

fish presented in further papers.

The project was funded by the World Bank and implemented by the Zoological Society of London (ZSL) (regionally represented by the Steppe Forward Programme) and the National University of Mongolia, in collaboration with the Mongolian Academy of Science, the Ministry for Nature and the Environment, the World Conservation Union (IUCN) as well as many other regional and international organisations.

Extensive research and data collection before and during the workshop, and an ongoing review process following the workshop has resulted in five main products. These are:

1. A species list of Mongolian mammals and fishes, in line with current nomenclature. Historically, there has been poor communication between Russian, Chinese, Mongolian and Western scientists, resulting in little agreement over accepted Mongolian species lists for most taxonomic groups. The workshop was an ideal forum to

- consolidate species lists, apply the International Code of Zoological Nomenclature, and develop an agreed list of all mammals and fishes in Mongolia.
2. The Mongolian Biodiversity Databank. This stores information on taxonomy, ecology, geographic distribution, population size, threats, utilisation, conservation measures and conservation status. The databank is held at the National University of Mongolia and is publicly available.
 3. Up-dated, digitised and peer-reviewed distribution maps of Mongolian mammals and fishes. During the workshop, experts developed the most up to date and accurate distribution maps of all Mongolian mammals and fishes. However, most species remain poorly studied and we envision that as more research is conducted, substantial changes will occur, which we encourage. These maps can be used to display the distribution of specific species or combined together to highlight areas with high species richness or areas with high numbers of threatened species. Such maps are important for communicating the state of Mongolian biodiversity and for setting priorities.
 4. A Red List for Mongolian mammals and for Mongolian fishes. Mongolian mammals and fishes were assessed with the IUCN Categories and Criteria for the first time. These Categories and Criteria have been designed to evaluate a species' risk of extinction. This system is more transparent and objective than previous approaches as it is based on quantitative criteria and clear justification for each conservation assessment is given.
 5. Summary Conservation Action Plans for species of particular conservation concern. At the workshop, participants developed action plans intended to highlight species that are of particular concern, and alert policy-makers and conservationists to actions that need to be taken if these species are to maintain viable populations into the future.

On the 31st October, at the National University of Mongolia in Ulaanbaatar, the aims of the workshop were presented and instruction was given on the application of the IUCN Red List Categories and

Criteria. The following three days of the workshop were held at Hustai National Park, south-west of Ulaanbaatar, where further training took place and the main objectives of the workshop were carried out. The final day of the workshop was held again at the National University of Mongolia where the major findings were presented to a broad audience of policy makers, journalists, scientists, conservationists and students. The findings presented here and in the subsequent papers are the results of the efforts of specialists who participated in the workshop, many of whom have dedicated their lives to studying Mongolian biodiversity. The results are based on data from the scientific literature, reports of governmental and non-governmental organisations (NGOs), data from museums and expert knowledge.

The Steering Committee, comprised of representatives from NGOs, academic institutions and government, provided support and guidance throughout the implementation of the project. It is the intention of the Committee and ZSL to continue to develop the Mongolian Biodiversity Databank with the next goal being the conservation assessment of all Mongolian vertebrates.

The Red Lists for Mongolian mammals and fishes

Red Lists, such as the 1997 Mongolian Red Book of threatened species (Shiirevdamba, *et al.*, 1997), have been in existence for nearly 60 years (Baillie & Groombridge, 1996). However, only recently have a set of quantitative criteria been developed by the IUCN to help standardise the way in which species are classified according to their extinction risk (Mace, 1994). The IUCN Red List Categories and Criteria were officially adopted in 1994 and revised in 2001 (IUCN, 2001). They are now recognised as an international standard and used by countries and organisations throughout the world. The Red Lists compiled at the Mongolian Biodiversity Workshop use the new IUCN Regional Categories and Criteria (IUCN, 2003).

The Red Lists only include wild populations inside their native range or populations resulting from benign introductions. The information in these articles is presented and discussed at the species level. Thus distinct subspecies within Mongolia, such as *Saiga tatarica monogolica*, an important Mongolian subspecies of the saiga antelope, is referred to as *Saiga tatarica*. The only taxa that are referred to at the subspecies level are the Gobi bear (*Ursus arctos gobiensis*), the Bactrian camel (*Camelus bac-*

trianus ferus) and Przewalski's horse (*Equus ferus przewalskii*). The Gobi bear was included because the subspecies was identified as an extremely important taxa for Mongolian conservation and was assessed at the subspecies level. The Bactrian camel is referred to as *Camelus bactrianus ferus* rather than *Camelus bactrianus* to make it clear that only the wild population is being considered. Recent taxonomic evidence (Oakenfull *et al.*, 2000) suggests that although they are genetically distinct, the domestic horse and Przewalski's horse are both subspecies of *Equus ferus* (Boddaert, 1785). Therefore in this article, Przewalski's horse will be referred to as *Equus ferus przewalskii*, indicating only wild horses are included in the assessment.

Although the main purpose of the list is to highlight species that are threatened with extinction, non-threatened native species are also listed. This has been done to provide insight into the overall status of Mongolia's biodiversity. The lists in this article are a summary of the Mongolian mammal and fish Red Lists still under review and which will be published later this year. The lists contain regional Red List assessments (assessments of the population within Mongolia) for each species of mammal and fish found in Mongolia. All mammal species and several fish species also have a global conservation status listed (assessments of the global population). The global assessments are primarily taken from the 2004 IUCN Red List of Threatened Species (IUCN, 2004). If the global assessment was changed at the workshop the assessment is denoted with an asterisk (*). Justification for these changes is given in the Mongolian Biodiversity Databank.

The application of the IUCN Regional Categories and Criteria

The IUCN Red List Categories and Criteria were developed to assess the global extinction risk of species. Applying this approach to species at a sub-global level (e.g. the country) involves addressing a number of issues not encountered when conduct-

ing assessments on a global scale. For example, a regional assessment has to take into account species that migrate between countries, or populations that are restricted to one country but dependant on immigration from another. The categories and criteria for regional application are adjusted to account for these differences. Two new definitions are included in the categories at the regional level. These are Regionally Extinct (RE) and Not Applicable (NA) (Table 1). RE is for species that remain extant, but are no longer found within the specific region. NA is for species that are deemed ineligible for assessment at a regional level because they have a marginal distribution in the region (Table 1).

The regional application of the categories is a two-step process. The first step is to apply the Red List criteria to the regional population using regional data, but as if it were the global population. In some cases this may produce an inaccurate estimate of the species threatened status, because the risk of extinction of the regional population may be influenced by a larger global population. To address this issue, the regional guidelines have a second step that allows the assessment to be adjusted. If a species is threatened regionally, but immigration from outside the region may occur and constitute a 'rescue' effect, this decreases the risk of extinction and the assessment can be downgraded accordingly. An assessment can be upgraded if the regional population is declining or is a 'sink' population, with no possibility of 'rescue' from outside. When an assessment has been up or downgraded, it is denoted with a double asterisk (**). If there is no information on the effects of populations surrounding the region no alteration is made (for further details see IUCN, 2003). This provides the species with a Red List assessment that better reflects the risk of extinction within the defined region. At the workshop, none of the mammal or fish regional assessments were altered, as there was little evidence for significant immigration and it was not known whether a 'rescue' effect from outside populations was likely.

Table 1. Definition of the categories used in the Red List (see IUCN, 2001).

Extinct (EX)	A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
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Extinct in the Wild (EW)	A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Regionally Extinct (RE)	A taxon is Regionally Extinct when there is no reasonable doubt that the last individual potentially capable of reproduction within the region has died or disappeared from the region: in the case of a former visiting taxon, individuals no longer visit the region. It is not possible to set general rules for a time period before a species is classified as RE. This will depend on how much effort has been devoted to searches for the species.
Critically Endangered (CR)	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered and it is therefore considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable and it is therefore considered to be facing a high risk of extinction in the wild.
Near Threatened (NT)	A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
Least Concern (LC)	A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.
Data Deficient (DD)	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.
Not Applicable (NA)	Species distribution in the region is less than 1% of its global distribution, and it has a very small range in the region (covering less than 1% of the total area of Mongolia)

Mammal and fish species lists

A series of meetings involving local and international Mongolian mammal experts were held to review and develop a mammal species list for Mongolia. The first of these meetings was held prior to the workshop where a draft list was developed, based on earlier lists compiled by the IUCN Global Mammals Assessment (IUCN-GMA, in prep. 1994), Tinnin *et al.* (2002), Wilson and Reeder (1993), Mallon (1985) and Dulamtseren (1968). Towards the end of the workshop, a meeting was held to address taxonomic issues raised throughout the week. This meeting was chaired by Prof. M. Stubbe and attended by twenty participants. Another taxonomic meeting took place on 15th November 2005 to confirm the list of species on which the databank and Red List would be based. This final list is set out in the summary of the 2005 Red List Assessment of Mongolian Mammals included in this article (Table 2) and contains 128 native species. Non-native species such as the American mink (*Mustela vison*),

brown rat (*Rattus norvegicus*), muskrat (*Ondatra zibethicus*) and house mouse (*Mus musculus*) are not listed even though they occur in Mongolia. The Red List contains species that were on the agreed species list for the workshop: those that were known to occur in Mongolia in 2005. Subsequent to the workshop, the addition of several new species has been suggested for species whose presence is suspected or likely based on occurrence close to the borders or due to expanding ranges. For example, *Eptesicus serotinus* (Schreber, 1774) is believed to be found around the north western border of China and may now be distributed in Mongolia. Other species occur around the borders of Mongolia and are thought to possibly have expanded their range to include Mongolia, such as *Microtus agrestis* (Linnaeus, 1761), *E. bottae* (Peters, 1869), *Sicista subtilis* (Pallas, 1773), *Sorex minutus* Linnaeus, 1766 and *S. araneus* Linnaeus, 1758. Once the presence of these species has been confirmed, they can be included in future red lists.

Table 2. Summary of the 2005 Red List Assessment of Mongolian Mammals. For definitions of Categories and Criteria, see IUCN (2003).

a) Artiodactyla

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Bovidae			
<i>Capra sibirica</i> (Pallas, 1776)	Siberian ibex	Near Threatened	Least Concern
<i>Gazella subgutturosa</i> (Güldenstädt, 1780)	Goitered gazelle	Vulnerable A3cd	Vulnerable
<i>Ovis ammon</i> (Linnaeus, 1758)	Argali	Endangered A4acd	Vulnerable A2cde
<i>Procapra gutturosa</i> (Pallas, 1777)	Mongolian gazelle	Endangered A3acde	Least Concern
<i>Saiga tatarica</i> (Linnaeus, 1766)	Saiga antelope	Endangered A2acd	Critically Endangered A2a
Camelidae			
<i>Camelus bactrianus ferus</i> Linnaeus, 1758	Bactrian camel	Endangered C1	Critically Endangered A3de & 4ade
Cervidae			
<i>Alces alces</i> (Linnaeus, 1758)	Moose	Endangered A2cd & A3d	Least Concern
<i>Capreolus pygargus</i> (Pallas, 1771)	Siberian roe deer	Least Concern	Least Concern
<i>Cervus elaphus</i> Linnaeus, 1758	Red deer	Critically Endangered A2acd & A3d	Least Concern
<i>Rangifer tarandus</i> (Linnaeus, 1758)	Reindeer	Vulnerable D1	Least Concern
Moschidae			
<i>Moschus moschiferus</i> Linnaeus, 1758	Siberian musk deer	Endangered A3ad	Vulnerable A1acd
Suidae			
<i>Sus scrofa</i> Linnaeus, 1758	Wild boar	Near Threatened	Least Concern

b) Carnivora

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Canidae			
<i>Canis lupus</i> Linnaeus, 1758	Grey wolf	Near Threatened	Least Concern
<i>Cuon alpinus</i> (Pallas, 1811)	Asiatic wild dog	Regionally Extinct	Endangered C2a(i)

<i>Nyctereutes procyonoides</i> (Gray, 1834)	Raccoon dog	Least Concern	Least Concern
<i>Vulpes corsac</i> (Linnaeus, 1768)	Corsac fox	Near Threatened	Least Concern
<i>Vulpes vulpes</i> Linnaeus, 1758	Red fox	Near Threatened	Least Concern
Felidae			
<i>Felis silvestris</i> Schreber, 1775	Wild cat	Data Deficient	Least Concern
<i>Lynx lynx</i> (Linnaeus, 1758)	Eurasian lynx	Least Concern	Near Threatened
<i>Otocolobus manul</i> (Pallas, 1776)	Pallas's cat	Near Threatened	Near Threatened
<i>Uncia uncia</i> (Schreber, 1775)	Snow leopard	Endangered C1	Endangered C2a(i)
Mustelidae			
<i>Arctonyx collaris</i> Cuvier, 1825	Hog badger	Data Deficient	Least Concern
<i>Gulo gulo</i> (Linnaeus, 1758)	Wolverine	Least Concern	Vulnerable A2c
<i>Lutra lutra</i> (Linnaeus, 1758)	Eurasian otter	Data Deficient	Near Threatened
<i>Martes foina</i> (Erxleben, 1777)	Beech marten	Data Deficient	Least Concern
<i>Martes zibellina</i> (Linnaeus, 1758)	Sable	Vulnerable A3cd	Least Concern
<i>Meles meles</i> (Linnaeus, 1758)	Eurasian badger	Least Concern	Least Concern
<i>Mustela altaica</i> Pallas, 1811	Mountain weasel	Least Concern	Least Concern
<i>Mustela erminea</i> Linnaeus, 1758	Stoat	Least Concern	Least Concern
<i>Mustela eversmanni</i> Lesson, 1827	Steppe polecat	Least Concern	Least Concern
<i>Mustela nivalis</i> Linnaeus, 1766	Least weasel	Least Concern	Least Concern
<i>Mustela sibirica</i> Pallas, 1773	Siberian weasel	Least Concern	Least Concern
<i>Vormela peregusna</i> (Güldenstädt, 1770)	Marbled polecat	Data Deficient	Least Concern
Ursidae			
<i>Ursus arctos</i> Linnaeus, 1758	Brown bear	Data Deficient	Least Concern
<i>Ursus arctos gobiensis</i> (Sokolov & Orlov, 1992)	Gobi bear	Critically Endangered D1	Not Evaluated

c) Chiroptera

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Vespertilionidae			
<i>Eptesicus gobiensis</i> Bobrinskii, 1926	Gobi big brown bat	Least Concern	Least Concern
<i>Eptesicus nilssonii</i> (Keyserling & Blasius, 1839)	Northern bat	Least Concern	Least Concern
<i>Hypsugo savii</i> (Bonaparte, 1837)	Savi's pipistrelle	Data Deficient	Least Concern
<i>Murina leucogaster</i> Milne-Edwards, 1872	Greater tube-nosed bat	Data Deficient	Least Concern
<i>Myotis brandti</i> (Eversmann, 1845)	Brandt's bat	Data Deficient	Least Concern
<i>Myotis daubentonii</i> (Kuhl, 1817)	Daubenton's bat	Least Concern	Least Concern
<i>Myotis ikonnikovi</i> Ognev, 1912	Ikonnikov's bat	Data Deficient	Least Concern
<i>Myotis mystacinus</i> (Kuhl, 1817)	Whiskered bat	Least Concern	Least Concern
<i>Nyctalus noctula</i> (Schreber, 1774)	Noctule	Data Deficient	Least Concern
<i>Plecotus auritus</i> (Linnaeus, 1758)	Brown long-eared bat	Least Concern	Least Concern
<i>Plecotus austriacus</i> (Fischer, 1829)	Grey long-eared bat	Data Deficient	Least Concern
<i>Vespertilio murinus</i> Linnaeus, 1758	Particoloured bat	Least Concern	Least Concern
<i>Vespertilio superans</i> Thomas, 1899	Asian particolored bat	Data Deficient	Least Concern

d) Erinaceomorpha

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Erinaceidae			
<i>Hemiechinus auritus</i> (Gmelin, 1770)	Long-eared hedgehog	Least Concern	Least Concern
<i>Mesechinus dauuricus</i> (Sundevall, 1842)	Daurian hedgehog	Least Concern	Least Concern

e) Lagomorpha

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Leporidae			
<i>Lepus timidus</i> Linnaeus, 1758	Arctic hare	Least Concern	Least Concern
<i>Lepus tolai</i> Pallas, 1778	Tolai hare	Least Concern	Not Evaluated
Ochotonidae			
<i>Ochotona alpina</i> (Pallas, 1773)	Alpine pika	Least Concern	Least Concern
<i>Ochotona dauurica</i> (Pallas, 1776)	Daurian pika	Least Concern	Least Concern
<i>Ochotona hyperborean</i> (Pallas, 1811)	Northern pika	Least Concern	Least Concern
<i>Ochotona pallasii</i> (Gray, 1867)	Pallas's pika	Least Concern	Least Concern

f) Perissodactyla

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Equidae			
<i>Equus hemionus</i> Pallas, 1775	Asiatic wild ass	Vulnerable A3cd	Vulnerable A3bcd & C1
<i>Equus ferus przewalskii</i> (Groves, 1986)	Przewalski's horse	Endangered D1	Endangered D1*

g) Rodentia

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Castoridae			
<i>Castor fiber</i> Linnaeus, 1758	Eurasian beaver	Endangered B1ab(iii)	Near Threatened
Cricetidae			
<i>Allocricetulus curtatus</i> (Allen, 1925)	Mongolian hamster	Least Concern	Least Concern
<i>Cricetulus barabensis</i> (Pallas, 1773)	Striped dwarf hamster	Least Concern	Least Concern
<i>Cricetulus longicaudatus</i> (Milne-Edwards, 1867)	Long-tailed dwarf hamster	Least Concern	Least Concern
<i>Cricetulus migratorius</i> (Pallas, 1773)	Grey hamster	Data Deficient	Near Threatened
<i>Cricetulus sokolovi</i> Orlov & Malugin, 1988	Sokolov's dwarf hamster	Data Deficient	Least Concern
<i>Phodopus campbelli</i> (Thomas, 1905)	Campbell's hamster	Least Concern	Least Concern
<i>Phodopus roborovskii</i> (Satunin, 1903)	Desert hamster	Least Concern	Least Concern
Dipodidae			
<i>Allactaga balikunica</i> Hsia & Fang, 1964	Balikus jerboa	Least Concern	Least Concern
<i>Allactaga bullata</i> Allen, 1925	Gobi jerboa	Data Deficient	Near Threatened
<i>Allactaga elater</i> (Lichtenstein, 1828)	Small five-toed jerboa	Endangered B1ab(iii)	Least Concern
<i>Allactaga sibirica</i> (Forster, 1778)	Mongolian five-toed jerboa	Least Concern	Least Concern
<i>Cardiocranius paradoxus</i> Satunin, 1903	Five-toed pygmy jerboa	Data Deficient	Vulnerable A1c
<i>Dipus sagitta</i> (Pallas, 1773)	Northern three-toed jerboa	Least Concern	Least Concern
<i>Euchoreutes naso</i> Sclater, 1891	Long-eared jerboa	Vulnerable B1ab(iii)	Endangered A1c
<i>Pygeretmus pumilio</i> (Kerr, 1792)	Dwarf fat-tailed jerboa	Least Concern	Least Concern
<i>Salpingotus crassicauda</i> Vinogradov, 1924	Thick-tailed pygmy jerboa	Data Deficient	Vulnerable A1c
<i>Salpingotus kozlovi</i> Vinogradov, 1922	Kozlov's pygmy jerboa	Data Deficient	Near Threatened
<i>Stylodipus andrewsi</i> Allen, 1925	Andrews's three-toed jerboa	Least Concern	Least Concern
<i>Stylodipus sungorus</i> Sokolov & Shenbrot, 1987	Mongolian three-toed jerboa	Endangered B1ab(iii)	Least Concern

Muridae

<i>Alticola barakshin</i> Bannikov, 1947	Gobi Altai mountain vole	Data Deficient	Least Concern
<i>Alticola macrotis</i> (Radde, 1862)	Large-eared vole	Data Deficient	Least Concern
<i>Alticola semicanus</i> (Allen, 1924)	Mongolian silver vole	Least Concern	Least Concern
<i>Alticola strelzowi</i> (Kastschenko, 1899)	Flat-headed vole	Data Deficient	Least Concern
<i>Alticola tuvinicus</i> Ognev, 1950	Tuva silver vole	Data Deficient	Least Concern
<i>Apodemus agrarius</i> (Pallas, 1771)	Striped field mouse	Data Deficient	Least Concern
<i>Apodemus peninsulae</i> (Thomas, 1907)	Korean field mouse	Least Concern	Least Concern
<i>Arvicola terrestris</i> (Linnaeus, 1758)	European water vole	Data Deficient	Least Concern
<i>Clethrionomys rufocanus</i> (Sundevall, 1846)	Grey red-backed vole	Least Concern	Least Concern
<i>Clethrionomys rutilus</i> (Pallas, 1779)	Northern red-backed vole	Least Concern	Least Concern
<i>Ellobius tancrei</i> Blasius, 1884	Zaisan mole vole	Least Concern	Least Concern
<i>Eolagurus luteus</i> (Eversmann, 1840)	Yellow steppe lemming	Data Deficient	Lower Risk (cd)
<i>Eolagurus przewalskii</i> (Büchner, 1889)	Przewalski's steppe lemming	Data Deficient	Least Concern
<i>Lagurus lagurus</i> (Pallas, 1773)	Steppe lemming	Data Deficient	Least Concern
<i>Lasiopodomys brandtii</i> (Radde, 1861)	Brandt's vole	Least Concern	Least Concern
<i>Lasiopodomys mandarinus</i> (Milne-Edwards, 1871)	Mandarin vole	Data Deficient	Least Concern
<i>Meriones meridianus</i> (Pallas, 1773)	Mid-day jird	Least Concern	Least Concern
<i>Meriones tamariscinus</i> (Pallas, 1773)	Tamarisk jird	Endangered B1ab(iii)	Least Concern
<i>Meriones unguiculatus</i> (Milne-Edwards, 1867)	Mongolian jird	Least Concern	Least Concern
<i>Micromys minutus</i> (Pallas, 1771)	Eurasian harvest mouse	Data Deficient	Near Threatened
<i>Microtus arvalis</i> (Pallas, 1778)	Common vole	Data Deficient	Least Concern
<i>Microtus fortis</i> Büchner, 1889	Reed vole	Data Deficient	Least Concern
<i>Microtus gregalis</i> (Pallas, 1779)	Narrow-headed vole	Least Concern	Least Concern
<i>Microtus limnophilus</i> Büchner, 1889	Lacustrine vole	Data Deficient	Least Concern
<i>Microtus maximowiczii</i> (Schrenk, 1859)	Maximowicz's vole	Data Deficient	Least Concern
<i>Microtus mongolicus</i> (Radde, 1861)	Mongolian vole	Least Concern	Least Concern
<i>Microtus oeconomus</i> (Pallas, 1776)	Root vole	Least Concern	Least Concern
<i>Myopus schisticolor</i> (Lilljeborg, 1844)	Wood lemming	Data Deficient	Near Threatened
<i>Myospalax aspalax</i> (Pallas, 1776)	False zokor	Data Deficient	Least Concern
<i>Myospalax psilurus</i> (Milne-Edwards, 1874)	Transbaikal zokor	Least Concern	Least Concern
<i>Rhombomys opimus</i> (Lichtenstein, 1823)	Great gerbil	Least Concern	Least Concern
Myoxidae			
<i>Dryomys nitedula</i> (Pallas, 1778)	Forest dormouse	Data Deficient	Near Threatened
Sciuridae			
<i>Marmota baibacina</i> Kastschenko, 1899	Grey marmot	Data Deficient	Least Concern
<i>Marmota sibirica</i> (Radde, 1862)	Siberian marmot	Endangered A2acd	Least Concern
<i>Pteromys volans</i> (Linnaeus, 1758)	Russian flying squirrel	Data Deficient	Near Threatened
<i>Sciurus vulgaris</i> Linnaeus, 1758	Eurasian red squirrel	Least Concern	Near Threatened
<i>Spermophilus alashanicus</i> Büchner, 1888	Alashan ground squirrel	Endangered C1	Least Concern

<i>Spermophilus dauricus</i> Brandt, 1843	Daurian ground squirrel	Data Deficient	Least Concern
<i>Spermophilus erythrogenys</i> Brandt, 1841	Red-cheeked ground squirrel	Least Concern	Least Concern
<i>Spermophilus undulatus</i> (Pallas, 1778)	Long-tailed ground squirrel	Least Concern	Least Concern
<i>Tamias sibiricus</i> (Laxmann, 1769)	Siberian chipmunk	Least Concern	Least Concern

h) Soricomorpha

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Soricidae			
<i>Crocidura sibirica</i> Dukelsky, 1930	Siberian shrew	Data Deficient	Least Concern
<i>Neomys fodiens</i> (Pennant, 1771)	Eurasian water shrew	Least Concern	Least Concern
<i>Sorex caecutiens</i> Laxmann, 1788	Laxmann's shrew	Least Concern	Least Concern
<i>Sorex daphaenodon</i> Thomas, 1907	Large-toothed Siberian shrew	Least Concern	Least Concern
<i>Sorex isodon</i> Turov, 1924	Even-toothed shrew	Data Deficient	Least Concern
<i>Sorex minutissimus</i> Zimmermann, 1780	Least shrew	Data Deficient	Least Concern
<i>Sorex roboratus</i> Hollister, 1913	Flat-skulled shrew	Data Deficient	Least Concern
<i>Sorex tundrensis</i> Merriam, 1900	Tundra shrew	Data Deficient	Least Concern
Talpidae			
<i>Talpa altaica</i> Nikolsky, 1883	Siberian mole	Data Deficient	Least Concern

An initial list of fish species present in Mongolia was compiled by Dr. Maurice Kottelat (Kottelat, in prep.). This was reviewed at a meeting in London prior to the working group session, and an updated version was produced for the workshop. The list was further edited and updated during the working group session by all participants. The Red List of Mongolian fishes contains 64 native species and is set out in the summary of the 2005 Red List Assessment of Mongolian Fishes (Table 3). Four species are omitted that have been deliberately introduced into the country, the grass carp (*Ctenopharyngodon idella*), silver carp (*Hypophthalmichthys molitrix*), *Coregonus peled* and *C. sardinella*. Mongolian fishes are still poorly known and research continues to update the number of species found in the country. Subsequent to the workshop, the addition of several new species has been suggested, including *Hemiculter varpachovskii* Nikolskii, 1903, an endemic to Buir Lake and the upper Amur River;

Microphysiogobio anudarini Holcík & Pivnicka, 1969, also an endemic to the Buir Lake region; and *Phoxinus ujmonensis* Kashenko, 1899, a distinct species from *P. phoxinus* found in the Bulgan River. These were not assessed at the workshop and are not included on the Red List. Two species that were assessed are thought to be lacking in evidence for their presence in Mongolia, *Triplophysa stoliczka* and *T. strauchii*, and have been removed from the Red List. In addition, three species have now been correctly identified, *Misgurnus mohoity* (Dybowski, 1869) (misidentified as *M. anguillicaudatus*), *Sarcocheilichthys soldatovi* (Berg, 1914) (misidentified as *S. nigripinnis*) and *Coregonus migratorius* (Georgi, 1775) (misidentified as *C. autumnalis*) and *Rutilus lacustris* has been identified as the same species as *Rutilus rutilus* (Linnaeus, 1758). These misidentifications do not alter the assessments and the names have been corrected in the Red List.

Table 3. Summary of the 2005 Red List Assessment of Mongolian Fishes

a) Petromyzontiformes

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Petromyzontidae			
<i>Lethenteron reissneri</i> (Dybowski, 1869)	Eastern brook lamprey	Not Applicable	Not Evaluated

b) Acipenseriformes

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Acipenseridae			
<i>Acipenser baerii</i> Brandt, 1869	Siberian sturgeon	Critically Endangered B2ab(iii,v)	Vulnerable A2d
<i>Acipenser schrenkii</i> Brandt, 1869	Amur sturgeon	Data Deficient	Endangered A1acd+2d

c) Cypriniformes

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Balitoridae			
<i>Barbatula dgebuadzei</i> (Prokofiev, 2003)	Gobi loach	Endangered B2ab(iii)	Not Evaluated
<i>Barbatula toni</i> (Dybowski, 1869)	Siberian stone loach	Least Concern	Not Evaluated
<i>Lefua costata</i> (Kessler, 1876)	Lefua	Not Applicable	Not Evaluated
<i>Triplophysa gundriseri</i> Prokofiev, 2003	Tes Gol loach	Data Deficient	Not Evaluated
Cobitidae			
<i>Cobitis melanoleuca</i> Nichols, 1925	Siberian spiny loach	Least Concern	Not Evaluated
<i>Misgurnus mohoity</i> (Dybowski, 1869)	Amur weather loach	Least Concern	Not Evaluated
Cyprinidae			
<i>Acheilognathus asmussi</i> (Dybowski, 1872)	Amur spiny bitterling	Near Threatened	Not Evaluated
<i>Carassius carassius</i> (Linne, 1758)	Crucian carp	Not Applicable	Not Evaluated
<i>Carassius gibelio</i> (Bloch, 1782)	Prussian carp	Least Concern	Not Evaluated
<i>Chanodichthys erythropterus</i> (Basilewsky, 1855)	Red-fin culter	Not Applicable	Not evaluated
<i>Chanodichthys mongolicus</i> (Basilewsky, 1855)	Mongolian culter	Not Applicable	Not Evaluated
<i>Culter alburnus</i> Basilewsky, 1855	Bleak culter	Not Applicable	Not Evaluated
<i>Cyprinus rubrofuscus</i> La Cepede, 1803	Asian carp	Not Applicable	Not Evaluated
<i>Eupallasea perenurus</i> Pallas, 1811	Lake minnow	Data Deficient	Not Evaluated
<i>Gnathopogon strigatus</i> (Regan, 1908)	Manchurian gudgeon	Not Applicable	Not Evaluated
<i>Gobio acutipinnatus</i> Menschikov, 1939	Irtysch gudgeon	Not Applicable	Not Evaluated
<i>Gobio cynocephalus</i> Dybowski, 1869	Dog-faced gudgeon	Data Deficient	Not Evaluated
<i>Gobio soldatovi</i> Berg, 1914	Amur gudgeon	Data Deficient	Not evaluated
<i>Gobio tenuicorpus</i> Mori, 1934	Eastern white gudgeon	Not Applicable	Not Evaluated
<i>Hemibarbus labeo</i> (Pallas, 1776)	Horse gudgeon	Data Deficient	Not Evaluated
<i>Hemibarbus maculatus</i> Bleeker, 1871	Spotted horse gudgeon	Data Deficient	Not Evaluated
<i>Hemiculter leucisculus</i> (Basilewsky, 1855)	Leuciscus	Not Applicable	Not Evaluated
<i>Ladislavia taczanowskii</i> Dybowski, 1869	Sharp-jawed minnow	Data Deficient	Not Evaluated
<i>Leuciscus baicalensis</i> (Dybowski, 1874)	Siberian dace	Least Concern	Not Evaluated
<i>Leuciscus dzungaricus</i> Koch & Paepke, 1998	Dzungarian dace	Endangered B1ab(v) & 2ab(v)	Not Evaluated
<i>Leuciscus idus</i> (Linnaeus, 1758)	Ide	Near Threatened	Not Evaluated
<i>Leuciscus waleckii</i> (Dybowski, 1869)	Amur ide	Data Deficient	Not Evaluated
<i>Microphysogobio tungtingensis</i> (Nichols, 1926)	Buir gudgeon	Data Deficient	Not Evaluated
<i>Oreoleuciscus angusticephalus</i> Bogutskaya, 2001	Lake osman	Vulnerable B1ab(v)	Not Evaluated
<i>Oreoleuciscus humilis</i> Warpachowski, 1889	Small osman	Vulnerable B2ab(ii,iii,iv,v)	Not Evaluated
<i>Oreoleuciscus potanini</i> (Kessler, 1879)	Potanin's osman	Least concern	Not Evaluated

<i>Phoxinus phoxinus</i> (Linnaeus, 1758)	Minnow	Least concern	Not Evaluated
<i>Pseudaspius leptcephalus</i> (Pallas, 1776)	False asp	Data Deficient	Not Evaluated
<i>Pseudorasbora parva</i> (Temminck & Schlegel, 1846)	Pseudorasbora	Data Deficient	Not Evaluated
<i>Rhodeus sericeus</i> (Pallas, 1776)	Amur bitterling	Data Deficient	Not Evaluated
<i>Rhynchocypris czekanowskii</i> (Dybowski, 1869)	Siberian minnow	Data Deficient	Not Evaluated
<i>Rhynchocypris lagowskii</i> (Dybowski, 1869)	Eastern Siberian minnow	Data Deficient	Not Evaluated
<i>Rutilus rutilus</i> (Linnaeus, 1758)	Roach	Least Concern	Not Evaluated
<i>Sarcocheilichthys soldatovi</i> (Berg, 1914)	Amur marble gudgeon	Not Applicable	Not Evaluated
<i>Saurogobio dabryi</i> Bleeker, 1871	Lizard gudgeon	Not Applicable	Not Evaluated
<i>Squalidus chankaensis</i> (Dybowski, 1872)	Khanka gudgeon	Not Applicable	Not Evaluated
<i>Tinca tinca</i> (Linnaeus, 1758)	Tench	Not Applicable	Not Evaluated

d) Esociformes

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Esocidae			
<i>Esox lucius</i> Linnaeus, 1758	Pike	Least Concern	Not Evaluated
<i>Esox reichertii</i> Dybowski, 1869	Amur pike	Least Concern	Not Evaluated

e) Gadiformes

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Lotidae			
<i>Lota lota</i> (Linnaeus, 1758)	Burbot	Data Deficient	Not Evaluated

f) Perciformes

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Odontobutidae			
<i>Perccottus glenii</i> Dybowski, 1877	Amur sleeper	Not Applicable	Not Evaluated
Perdicae			
<i>Perca fluviatilis</i> Linnaeus, 1758	Perch	Least Concern	Not Evaluated

g) Salmoniformes

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Coregonidae			
<i>Coregonus migratorius</i> (Georgi, 1775)	Baikal omul	Data Deficient	Not Evaluated
<i>Coregonus chadary</i> Dybowski, 1869	Chadry	Data Deficient	Not Evaluated
<i>Coregonus pidschian</i> (Gmelin, 1788)	Pidschian	Endangered B2ab(iii,v)	Data Deficient
Thymallidae			
<i>Thymallus arcticus</i> (Pallas, 1776)	Arctic grayling	Near Threatened	Not Evaluated
<i>Thymallus brevirostris</i> Kessler, 1879	Mongolian grayling	Vulnerable B2ab(iii,v)	Not Evaluated
<i>Thymallus grubei</i> Dybowski, 1869	Amur grayling	Endangered B2ab(iii,v)	Not Evaluated
<i>Thymallus nigrescens</i> Dorogostaisky, 1923	Khövsgöl grayling	Endangered B2ab(i,ii,iii,iv,v)	Not Evaluated
Salmonidae			
<i>Brachymystax lenok</i> (Pallas, 1773)	Lenok	Vulnerable A3d	Not Evaluated
<i>Hucho taimen</i> Pallas, 1773	Taimen	Endangered A2de & A3de; B2ab(iii,v)	Not Evaluated

h) Scorpaeniformes

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
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Cottidae			
<i>Cottus sibiricus</i> Kessler, 1889	Siberian sculpin	Data Deficient	Not Evaluated
<i>Cottus szanaga</i> Dybowski, 1869		Data Deficient	Not Evaluated
<i>Leocottus kesslerii</i> (Dybowski, 1874)	Kessler's sculpin	Data Deficient	Not Evaluated
<i>Mesocottus haitej</i> (Dybowski, 1869)	Amur sculpin	Data Deficient	Not Evaluated

i) Siluriformes

<i>Scientific name</i>	<i>Common name</i>	<i>Regional assessment</i>	<i>Global assessment</i>
Siluridae			
<i>Silurus asotus</i> Linnaeus, 1758	East Asian catfish	Least Concern	Not Evaluated

The Mongolian Biodiversity Databank

The Biodiversity Databank is central to the other products developed at the workshop. The Databank contains information on all Mongolian mammal and fish species and will hopefully be expanded in the near future to contain a much broader range of taxonomic groups. By starting with fishes and mammals, the utility of the Databank was tested on two groups with different levels of available information, the poorly known fishes and the relatively well-known mammals. Both groups have likely undergone significant changes in their conservation status in recent decades. The data collected for these groups has formed a baseline dataset that can be continually updated. The Databank is intended as a resource for students, researchers, conservationists, policy makers and the general public. It contains detailed information on species ecology, population trends, distribution, preferred habitats, threats, conservation measures and the rationale for the Red List assessment. Individuals wishing to obtain more information are encouraged to use this database (contact N. Batsaikhan, batsaikhan@biology.num.edu.mn, at NUM).

Species distribution maps

Digitised maps of Mongolian mammals were provided by the IUCN Global Mammal Assessment (IUCN-GMA, in prep.). These maps were reviewed and modified at the workshop and the justification for all changes documented. This documentation is available with the Biodiversity Databank. The changes were then added to digitised maps using ArcView 3.0. Digitised maps showing the distribution of fishes in Mongolia were created for the first time using this programme. Fish distribution maps incorporate the river-basins and lake catchment areas, some of which extend outside Mongolia's borders. All species maps will be published in the Mongolian mammal and fish Red Lists later this year. However, in many cases these are preliminary

maps, particularly for small mammals; these are expected to change as more research is conducted.

Summary Conservation Action Plans

Species of particular conservation concern or commercial importance were identified by experts before the workshop. Towards the end of the workshop, available participants reviewed the list and began developing action plans for individual species. The summary action plans are intended to highlight species under threat and make policy-makers and conservationists aware of actions that need to be taken if these species are to maintain viable populations into the future. They present information about the status of the species, its current known distribution, the threats it faces, any specific conservation measures already in place, and suggest required conservation measures. They are not intended to replace more detailed action plans which exist for many of these species and are still required for many more. The Summary Conservation Action Plans are in the final review stage and will be published later in 2006.

Conclusions

The Mongolian Biodiversity Databank workshop was a success, with over 70 specialists attending who applied their expertise to the problems facing Mongolian mammals and fish. All expected outputs are being produced: publications on threats facing Mongolian mammals and fishes are published in this journal, and the Red Books of Mongolian mammals and fishes and Summary Conservation Action Plans of some animals will be published later this year. A further benefit of the workshop was production of the Mongolian Biodiversity Databank, as well as updated maps and species lists for mammals and fishes. The information gathered in the workshop will provide a baseline from which all future conservation of Mongolian mammals and fish can be measured. The Databank itself, together with the

library being formed, will provide an invaluable tool for future researchers.

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