Peat swamp biodiversity in the Qizimei Mountain National Nature Reserve, China

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SUMMARY

The Qizimei Mountain National Nature Reserve (QMNNR) is located in a hotspot for endemic species in China's subtropical zone and contains large patches of sub-alpine peat swamp. To compile a species inventory and illustrate the threats to biodiversity in QMNNR, we conducted field surveys for peat swamp flora and macro-fauna from June 2011 to July 2012. The resulting species list comprises 198 plant, eight amphibian, five reptile, 25 fish, 47 bird and eleven mammal taxa. Of these, nine species are regarded as globally threatened and three as invasive aquatic species. Due to sampling bias and incompleteness we may have under-estimated the number of species and, therefore, it is likely that further species will be added to the list in future surveys. Available evidence suggests that over-exploitation of moss, habitat destruction, and introduction of non-native species are the main threats to peatland biodiversity in the QMNNR. To protect native biodiversity and restore the sub-alpine peatland ecosystem in QMNNR and similar locations, we suggest that conservation effort should include restrictions on moss harvesting, prohibition of hunting, allowing vegetation to recover by restricting human disturbance, and monitoring and removal of non-native species.

KEY WORDS: conservation, central China, sub-alpine peat, invasive species, subtropical zone

INTRODUCTION

Traditionally, peat was widely regarded as wasteland because of its inaccessibility and low productivity (Rijksen & Peerson 1991, Yeh 2009). However, it is now recognised that peat ecosystems provide many important ecological and economic benefits such as carbon accumulation, climate regulation, biodiversity protection, water conservation and a source of biofuel (Ma *et al.* 1991, Turetsky *et al.* 2012, Yang *et al.* 2017). Thus, recently increasing numbers of researchers and environmental organisations are paying attention to the conservation and management of mires and peatlands (Yule 2010, Posa *et al.* 2011, Li *et al.* 2018).

China is rich in terms of both the types of, and the area covered by, its wetland resources (Wang 2004, Gong *et al.* 2010). The majority of Chinese peatlands are located in the Qinghai-Tibetan Plateau and in the north-east including the Greater Khingan Mountains, Lesser Khingan Mountains and Changbai Mountain (Yang *et al.* 2017). Recently, large patches of sub-alpine peatland were discovered in western Hubei Province (Shennongjia Forestry District and Enshi Autonomous Prefecture), central China. Compared with the peatlands in cold, elevated regions of China, these subtropical, sub-alpine peatlands developed under different climate and geological conditions, leading to the development of specific habitat conditions and biodiversity (Liu & Qu 2006). Despite the recently increasing knowledge of biodiversity in Chinese wetlands (SFA 2015), information regarding the biodiversity of sub-alpine peatland in the subtropical zone of China is still scarce. Compiling a species inventory and illustrating the threats to biodiversity would, therefore, benefit the protection and management of sub-alpine peatland ecosystems in China and similar climate zones.

The Qizimei Mountain National Nature Reserve (QMNNR) is located in Enshi Autonomous Prefecture, Hubei Province, central China, in the biodiversity hotspot of the 'Eastern Sichuan-Western Hubei endemic species distribution centre'. This region functioned as a refuge for ancient relic plants during the glacier activity of the Tertiary period and harbours a high number of endemic, rare and endangered species (Ying & Zhang 1994, Liu & Qu 2006, NEPA 2011, Gao *et al.* 2018). Here, the complex geological environment and climatic conditions support high levels of biodiversity (Liu &

Qu 2006). Thus, the QMNNR is listed as one of China's priority conservation areas and a key global biodiversity area (Liu & Qu 2006, MEP 2011). The peat swamp here covers a large area and is distributed as large patches interspersed with montane forests. It is well developed and preserved, with large numbers of moss mounds. This peatland functions as the upper catchment of the Youshui River and maintains specific habitat for a large number of rare and endemic species (Wang *et al.* 2013).

Many scientific investigations have focused on biodiversity in the QMNNR (Liu *et al.* 2002, Liu & Qu 2006, Ma *et al.* 2008, Wang *et al.* 2013). However, due to its inaccessibility, the peatland areas of QMNNR were not investigated until the 2000s and the reserve's peatland biodiversity has not yet been sufficiently studied. Producing a species inventory is an important initial step for conservation and management of peatland biodiversity (Kleinebecker *et al.* 2010, Li & Quan 2017, Sushko 2018). With this in mind, the purpose of this study was to: (1) compile a comprehensive list of flora and fauna in the peat swamp of QMNNR; (2) summarise the potential threats to this peatland biodiversity; and (3) generate suggestions for the conservation and management of biodiversity in the peat swamp of QMNNR.

METHODS

Study site

The QMNNR lies between 29° 39.50′ – 30° 05.25′ N and 109° 38.50′ – 109° 47.00′ E, at 650–2,015 m a.s.l. (Figure 1). The total area of the reserve is 34,550 ha (core area: 11,560 ha, buffer area 11,700 ha, experimental area 11,290 ha) (Liu & Qu 2006, QMNNRA 2020). The area was established as a county-level reserve in 1990 and upgraded to a National Reserve in 2008, for the conservation of rare plants (e.g., as a primary community of *Davidia involucrate*) and animals (e.g., *Neofelis nebulosi* and *Panthera pardus*), and for its subtropical forest and sub-alpine wetland ecosystems (Wang *et al.* 2013). A patchy distribution of sub-alpine peat swamp is found within forests and bush woods at elevations of 1,650–1,950 m a.s.l. (total peatland area: 940 ha, located between 29° 57.45' – 30° 03.68' N and 109° 44.63' – 109° 46.90' E). *Sphagnum palustre* L. is the dominant plant species in peatland areas and forms a large number of hummocks (Li *et al.* 2018). The average ground coverage of *S. palustre* is 88.6 % (Ma *et al.* 2008). Abundant species in the area include trees (such as *Enkianthus chinensis* and *Rhododendron auriculatum*), shrubs (such as *Fargesia spathacea* and *Malus hupehensis*), and herbs (such as *Juncus setchuensis*, *Lycopus cavaleriei* and *Carex rubrobrunnea* var. *taliensis*) (Wang *et al.* 2013). Tree canopy cover is about 70 % (Wang *et al.* 2013, Li *et al.* 2018).

The reserve is located on the north-east extension of the Yunnan-Guizhou Plateau, covering the Qizimei, Qinjiada and Badagong Mountains. The region experiences a subtropical humid monsoon climate with vertical differentiation (Li *et al.* 2018). The annual average temperature of the mountainous areas above 1,200 m a.s.l. (in which all of the peat is found) is 8.9 °C, the frost-free period is 203 days, the annual precipitation is 1,876 mm, and annual sunshine is 1,520 h (QMNNRA 2020).

Plant and animal surveys

In total, 57 patches of peatland are distributed across the QMNNR, most (except Patches 44–47; Figure 1) lying in the core area of the reserve. From July 2011 to April 2012 we conducted extensive geobotanical surveys of eight patches (nos. 20–22, 51–53 and 56–57) at different altitudes (range: 1752–1953 m a.s.l.; Figure 1). Within each patch we selected one plot of 20 × 30 m for surveying trees, five plots of 5 × 5 m for shrubs, and 25 plots of 2 × 2 m for grass. Sampling plots were selected systematically according to the landform and vegetation. Within each plot we recorded all plant species present, following standardised methods for plant community inventories described by Fang *et al.* (2009). Plant specimens were collected, dried and kept in the herbarium of Hubei University according to protocols outlined by Wu (2001).

Fish sampling was conducted during different seasons from June 2011 to April 2012 using gillnets (20 × 10 m, mesh size 0.5 cm), cage nets (200 × 10 × 15 cm, mesh size 0.5 cm) and electrofishing (CWB-2000 P, 12 V, 250 Hz) in the rivers, pools, and lakes in seven peatland patches adjacent to river (nos. 20–22 and 44–47; Figure 1). The fish were stunned by the electrofishing but revived in a few seconds. After classification, all fish were released. Total trapping effort included 120 trap hours with gillnets (~1–2 h per survey), 120 trap nights for cage nets (22:00–08:00 hrs) and 23 electrofishing hours (~0.5 h per survey). For detailed sampling methods see Xiong e*t al*. (2017a). We also interviewed local fisherman for information on the fish species they had seen in the area, using photographs from Yang (1987).

For mammals we conducted visual encounter surveys along 1–2 km line transects and collated ad hoc observations in nine patches (nos. 39–42, 48–49 and 55–57) from February to July 2012. In addition, we interviewed local former hunters (n = 2) and checked the animal fur purchase record (1974–1988)

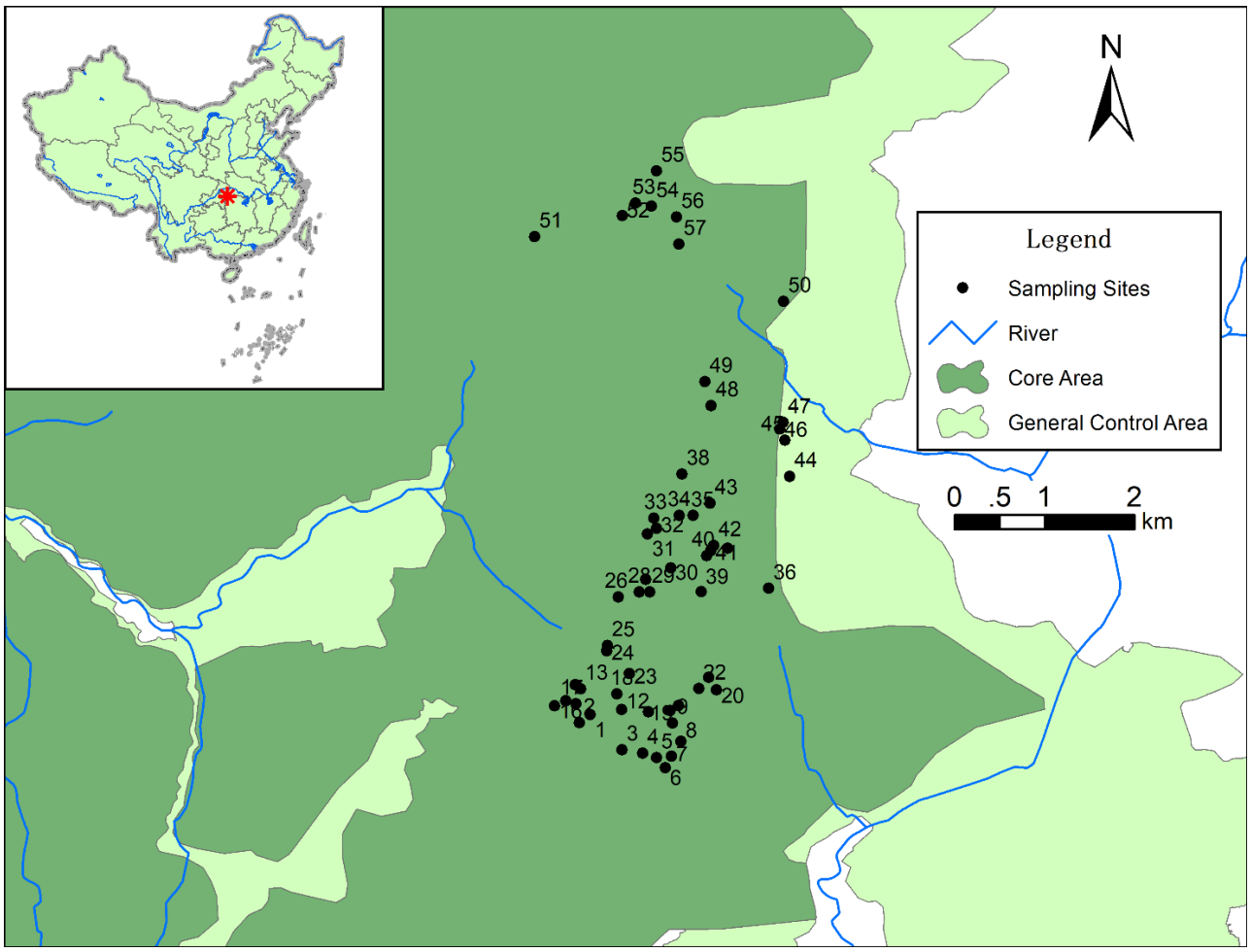

Figure 1. Locations of peatland sampling sites in the QMNNR, and (inset) of the QMNNR within China.

for Xuan'en County (which includes the QMNNR) to confirm historical species presence in the county. Since gun ownership was forbidden in 1996, local hunters have switched to other livelihoods and rural marketing agents have terminated the pursuit of mammal fur. For detailed methods see Liu *et al.* (2002).

For amphibians and reptiles we conducted visual encounter and manual acoustic surveys along the same transects as for mammal surveys from February to July 2012 (Wang *et al.* 2013). In total, 120 h of visual encounter surveys were completed, of which 40 h were diurnal (~1–2 h per survey) and 80 h were nocturnal (~1–3 h per survey); plus 200 h of acoustic surveys (~120 h diurnal and 80 h nocturnal). For detailed methods see Wang *et al.* (2013).

Bird surveys were conducted through ~140 h of point counts at dawn (06:00–08:00 hrs) and dusk (07:00–19:00 hrs), transect surveys (1–2 km line transects, ~35 h total survey time), camera traps (~620 h total survey time). Also, ad hoc observations were conducted from February to July 2012 in the same patches as for mammal survey. For detailed methods see Wang *et al.* (2013) and Yang & Wu (2012).

RESULTS

In total, 294 species were recorded in the QMNNR, including 198 plant (two Bryophyta, eight Pteridophyta, four Gymnospermae and 184 Angiospermae), 47 bird, 25 fish, eight amphibian, five reptile and eleven mammal species (Tables A1–A5 in the Appendix). According to the IUCN Red List, nine of these species are globally threatened, including three plant species (*Magnolia officinalis*, *Aralia chinensis*, *Gastrodia elata*), three amphibians (*Pseudohynobius flavomaculatus*, *Andrias davidianus*, *Quasipaa spinose*) and three mammals (*Elaphodus cephalophus*, *Moschus berezovskii*, *Trogopterus xanthipes*). We recorded three invasive species, namely the plants *Alternanthera philoxeroides* and *Eichhornia crassipes*, and the fish *Gambusia affinis*.

DISCUSSION

Threats to biodiversity in the QMNNR peatland

The main threats to biodiversity in the peatland of QMNNR include over-exploitation of moss, habitat destruction, and biological invasion.

The abundance and coverage of moss in QMNNR has diminished because of habitat destruction and excessive harvesting for horticultural purposes (Li *et al.* 2018). Before establishment of the National Reserve, about 150 tons of moss were harvested every year by local villagers (Liu & Qu 2006). These moss collection activities reduced the abundance of *S. palustre* by removing large-volume moss mats (Li *et al.* 2018). Intensive and frequent moss collection has also destroyed the moss mounds and diminished the area of peatland in Lichuan (Enshi Autonomous Prefecture) and Dajiuhu (Shennongjia Foresty District) (Peng *et al.* 2001, Liu & Qu 2006). This decrease of *Sphagnum* moss was reported to promote invasion of the non-native species *Trifolium pretense* in the Dajiuhu peatland (Peng *et al.* 2001). The decrease of moss coverage may therefore increase the risk of plant invasion in QMNNR as well.

Before the 1990s, some local villagers hunted wild animals in QMNNR and adjacent areas, including protected species such as *Moschus berezovskii* and *Andrias davidianus*. Many bird and amphibian species were also trapped and sold as pets (personal communications with local former hunters). Large mammals were usually hunted for fur and feathers. The number of mammal furs sold in Xuan'en County decreased from 1974 to 1988, suggesting a possible wildlife population decline. For example, the number of muntjac fur pelts on sale was 2,109 in 1973 and 2,416 in 1974, but decreased to 613 in 1984 and 24 in 1989 (Liu & Qu 2006). As a likely result of this, populations of some protected species (such as *Aix galericulata*, *Anas Formos*a, and *Tragopan temminckii*) decreased rapidly in QMNNR (Liu & Qu 2006). Since the prohibition of gun ownership in 1996 and establishment of the National Reserve in 2008, animal hunting has been forbidden in the core area of QMNNR, allowing wildlife populations to recover.

Hubei Province is a region with abundant trade in aquatic species and documented introduction of non-native aquatic species (Xiong *et al.* 2018, Wang *et al.* 2020). Numerous non-native species have been introduced and naturalised in central China, such as *A. philoxeroides*, *E. crassipes* and *G. affinis* (Xiong *et al.* 2019). *A. philoxeroides* and *E. crassipes* usually form dense mats on the water surface, reducing water oxygen levels and thus causing deterioration of native aquatic fauna (Xiong *et al.* 2018). *G. affinis* could be a predator of native small fish and amphibian species, potentially leading to decline in the populations of these species (Xiong *et al.* 2015). The non-native species may spread through adjoining rivers and lakes and cause enormous threats to peatland biodiversity in the region.

Conservation implications

Our investigation identified 294 species in the peatland of the QMNNR, of which nine are classified as threatened according to the IUCN Red List. The total of 198 plant species found in our surveyed patches is much higher than the total recorded for Dajiuhu peatland (24 plant species) in Shenongjia, Hubei Province, which is the only other peatland in this climate zone of China for which data are available (Peng *et al.* 2001). The patchily distributed peatlands in QMNNR overlap with alpine vegetation, leading to a high diversity of vascular plants (Ma *et al.* 2008). Furthermore, it is noteworthy that we may have under-estimated the number of species owing to, for instance, sampling bias towards areas that are more accessible for surveying and relatively small sample sizes in the surveyed patches.

To protect native biodiversity and restore sub-alpine peatland ecosystems in QMNNR and beyond, conservation efforts should include restrictions on moss harvesting in the core area, prohibition of hunting wild animals, vegetation recovery (through restricting human disturbance such as livestock grazing and gathering herbs) and monitoring and control of non-native aquatic species. Establishment of the National Nature Reserve minimised human disturbance in the core area of QMNNR and benefited recovery of the peatland ecosystem. For better enforcement of these regulations, poverty alleviation and economic restructuring measures should be adopted by government and local communities in order to develop alternative livelihoods for local people, enabling them to switch from moss harvesting and wildlife hunting to other economic activities that do not harm the ecology and biodiversity of the peatland ecosystem. Although invasive species were found in the surveyed area, little is known about their effects on native biodiversity and the local environment in sub-alpine peat swamps such as those in QMNNR. China is one of the countries most seriously threatened by invasion of aquatic organisms, and many non-native species have severely affected its native biodiversity (Wang *et al.* 2016, Cheng *et al.* 2018, Xiong *et al.* 2015, 2017b). Thus, more attention should be paid to the ecological impacts, control and management of these non-native species in peatlands in the future, particularly in China.

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AUTHOR CONTRIBUTIONS

HW contributed to writing the original draft; TTL managed the literature searches; HW, TTL, NR, MYH and HQJ conducted field investigations; TTL designed and made the Figure; ZXW reviewed and edited the final manuscript.

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Appendix

Table A1. List of plant species recorded in the peatland of Qizimei Mountain National Nature Reserve. Extinction risk abbreviations follow IUCN Red List categories: NT-Near Threatened, VU-Vulnerable, EN-Endangered, CR-Critically Endangered. Not all patches were surveyed (see Methods).

Phylum	**Class**	**Order**	**Family**	**Species**	**Extinction Risk**	**Patches where found**
Bryophyta	Bryopsida	Dicranales	Ditrichaceae	*Ceratodon purpureus* (Hedw.) Brid.		57
Bryophyta	Bryopsida	Sphagnales	Sphagnaceae	*Sphagnum palustre* L.		20, 21, 22, 51, 52, 53, 56, 57
Pteridopyhta	Lycopodiinae	Lycopodiales	Lycopodiaceae	*Lycopodium japonicum* Thunb.		20, 22, 51, 52
Pteridopyhta	Lycopodiinae	Lycopodiales	Lycopodiaceae	*Lycopodium obscurum* L.		21, 52, 53
Pteridopyhta	Leptosporangiopsida	Polypodiales	Pteridaceae	*Cheilosoria chusana* (Hook.) Ching		52
Pteridopyhta	Protoleptosporangiopsida	Osmundales	Osmundaceae	*Osmunda japonica* Thunb.		52, 57
Pteridopyhta	Leptosporangiopsida	Polypodiales	Dennstaedtiaceae	*Pteridium aquilinum* var. *latiusculum* (Desv.) Underw. ex Heller		20, 22, 51, 52, 53, 57
Pteridopyhta	Leptosporangiopsida	Polypodiales	Thelypteridaceae	*Cyclosorus acuminatus* (Houtt.) Nakai ex H. Itô		52
Pteridopyhta	Leptosporangiopsida	Polypodiales	Thelypteridaceae	*Parathelypteris nipponica* (Franch. & Sav.) Ching		52, 57
Pteridopyhta	Leptosporangiopsida	Polypodiales	Polypodiaceae	*Lepisorus contortus* (H.Christ) Ching		56
Gymnospermae	Coniferopsida	Coniferales	Pinaceae	*Larix kaempferi* (Lamb.) Carrière		51, 52
Gymnospermae	Coniferopsida	Coniferales	Pinaceae	*Pinus armandii* Franch.		52
Gymnospermae	Coniferopsida	Coniferales	Pinaceae	*Pinus tabuliformis* Carrière		52, 57
Gymnospermae	Coniferopsida	Cephalotaxales	Cephalotaxaceae	*Cephalotaxus fortunei* Hook.		56
Angiospermae	Dicotyledones	Piperales	Saururaceae	*Houttuynia cordata* Thunb.		20, 21
Angiospermae	Dicotyledones	Salicales	Salicaceae	*Populus lasiocarpa* Oliv.		20, 21, 52, 53, 57
Angiospermae	Dicotyledones	Salicales	Salicaceae	*Salix hypoleuca* Seemen		57
Angiospermae	Dicotyledones	Salicales	Salicaceae	*Salix tetrasperma* Roxb.		57

Phylum	Class	Order	Family	Species	Extinction Risk	Patches where found
Angiospermae	Dicotyledones	Fagales	Betulaceae	*Betula utilis* D.Don		52
Angiospermae	Dicotyledones	Fagales	Betulaceae	*Carpinus viminea* Wall.		53
Angiospermae	Dicotyledones	Fagales	Betulaceae	*Corylus ferox* var. *thibetica* (Batal.) Franch.		51, 53
Angiospermae	Dicotyledones	Fagales	Betulaceae	*Corylus heterophylla* var. *sutchuanensis* Franchet		53,56
Angiospermae	Dicotyledones	Fagales	Betulaceae	*Corylus yunnanensis* (Franch.) A.Camus		51
Angiospermae	Dicotyledones	Fagales	Fagaceae	*Castanea seguinii* Dode		52, 53
Angiospermae	Dicotyledones	Rosales	Moraceae	*Morus australis* Poir.		20, 21
Angiospermae	Dicotyledones	Caryophyllales	Polygonaceae	*Polygonum nepalense* Meisn.		20, 52, 57
Angiospermae	Dicotyledones	Caryophyllales	Polygonaceae	*Polygonum perfoliatum* L.		52, 53
Angiospermae	Dicotyledones	Caryophyllales	Polygonaceae	*Polygonum sagittatum* L.		57
Angiospermae	Dicotyledones	Caryophyllales	Polygonaceae	*Polygonum thunbergii* Siebold & Zucc.		20, 56, 52, 53, 57
Angiospermae	Dicotyledones	Caryophyllales	Polygonaceae	*Reynoutria japonica* Houtt.		21, 22
Angiospermae	Dicotyledones	Caryophyllales	Caryophyllaceae	*Silene baccifera* (L.) Roth		20
Angiospermae	Dicotyledones	Caryophyllales	Amaranthaceae	*Alternanthera philoxeroides* (Mart.) Griseb.		22
Angiospermae	Dicotyledones	Nymphaeales	Cabombaceae	*Brasenia schreberi* J.F.Gmel.		20
Angiospermae	Dicotyledones	Ranales	Ranunculaceae	*Aconitum hemsleyanum* E.Pritz.		57
Angiospermae	Dicotyledones	Ranales	Ranunculaceae	*Asteropyrum peltatum* (Franch.) J.R.Drumm & Hutch.		52
Angiospermae	Dicotyledones	Ranales	Ranunculaceae	*Ranunculus japonicus* Thunb.		56
Angiospermae	Dicotyledones	Ranales	Ranunculaceae	*Thalictrum uncinulatum* Franch. ex Lecoy.		51
Angiospermae	Dicotyledones	Berberidales	Lardizabalaceae	*Decaisnea insignis* (Griff.) Hook.f. & Thomson		53
Angiospermae	Dicotyledones	Berberidales	Berberidaceae	*Berberis triacanthophora* Fedde		51
Angiospermae	Dicotyledones	Magnoliales	Magnoliaceae	*Houpoea officinalis* (Rehder & E.H.Wilson) N.H.Xia & C.Y.Wu	EN	52, 53

Phylum	**Class**	**Order**	**Family**	**Species**	**Extinction Risk**	**Patches where found**
Angiospermae	Dicotyledones	Laurales	Lauraceae	*Lindera glauca* (Siebold & Zucc) Blume		53
Angiospermae	Dicotyledones	Laurales	Lauraceae	*Lindera obtusiloba* Blume		20, 22, 51, 52, 53, 56
Angiospermae	Dicotyledones	Laurales	Lauraceae	*Litsea cubeba* (Lour.) Pers.		20, 22, 51, 53, 57
Angiospermae	Dicotyledones	Laurales	Lauraceae	*Litsea ichangensis* Gamble		20, 21, 22, 51, 52, 53, 56
Angiospermae	Dicotyledones	Brassicales	Brassicaceae	*Cardamine engleriana* O.E.Schulz		57
Angiospermae	Dicotyledones	Saxifragales	Saxifragaceae	*Astilbe chinensis* (Maxim.) Franch. et Savat.		20, 57
Angiospermae	Dicotyledones	Cornales	Hydrangeaceae	*Hydrangea aspera* D.Don		53
Angiospermae	Dicotyledones	Cornales	Hydrangeaceae	*Hydrangea macrophylla* (Thunb.) Ser.		57
Angiospermae	Dicotyledones	Cornales	Hydrangeaceae	*Hydrangea strigosa* Rehder		20, 51, 52, 53, 57
Angiospermae	Dicotyledones	Cornales	Hydrangeaceae	*Hydrangea aspera* D.Don		20
Angiospermae	Dicotyledones	Celastrales	Celastraceae	*Parnassia wightiana* Wall. ex Wight & Arn.		20
Angiospermae	Dicotyledones	Saxifragales	Saxifragaceae	*Tiarella polyphylla* D.Don		56
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Cerasus yunnanensis* (Franch.) Yü et Li		52
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Prunus clarofolia* C.K.Schneid.		57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Cotoneaster apiculatus* Rehder & E.H.Wilson		51
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Cotoneaster bullatus* Bois		20, 21, 22, 51, 52, 53, 57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Cotoneaster glabratus* Rehder & E.H.Wilson		57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Cotoneaster horizontalis* Decne.		22
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Cotoneaster tenuipes* Rehder & E.H.Wilson		57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Fragaria orientalis* Losinsk.		20, 21, 57

Phylum	Class	Order	Family	Species	Extinction Risk	Patches where found
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Malus hupehensis* (Pamp.) Rehd.		20, 21, 51, 52, 53, 57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Malus sieboldi*i (Regel) Rehder		57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Potentilla lineata* Trevir.		21, 22, 51
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Rosa helenae* Rehder & E.H.Wilson		20, 21, 52, 57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Rubus caudifolius* Wuzhi		52, 57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Rubus corchorifolius* L.f.		52
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Rubus henryi* Hemsl. & Kuntze		20
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Rubus malifolius* Focke		56
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Rubus peltatus* Maxim.		56, 52, 57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Rubus trianthus* Focke		51, 57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Sorbus caloneura* (Stapf) Rehd.		51
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Sorbus folgneri* (C.K.Schneid.) Rehder		51
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Sorbus wilsoniana* C.K.Schneid.		22, 51, 52, 53, 56, 57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Sorbus aucuparia* L.		22
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Spiraea japonica* var. *fortunei* (Planchon) Rehd.		56, 57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Spiraea veitchii* Hemsl.		51, 53, 56, 57
Angiospermae	Dicotyledones	Rosales	Rosaceae	*Stranvaesia davidiana* Dcne.		53
Angiospermae	Dicotyledones	Rosales	Leguminosae	*Trifolium repens* L.		20, 21
Angiospermae	Dicotyledones	Rosales	Leguminosae	*Trifolium pratense* L.		21
Angiospermae	Dicotyledones	Geraniales	Oxalidaceae	*Oxalis corniculata* L.		56
Angiospermae	Dicotyledones	Geraniales	Geraniaceae	*Geranium rosthornii* R.Knuth		57
Angiospermae	Dicotyledones	Sapindales	Simarubaceae	*Ailanthus altissima* (Mill.) Swingle		57

Phylum	Class	Order	Family	Species	Extinction Risk	Patches where found
Angiospermae	Dicotyledones	Sapindales	Anacardiaceae	*Terminthia paniculata* (Wall. ex G.Don) C.Y.Wu & T.L.Ming		52
Angiospermae	Dicotyledones	Aquifoliales	Aquifoliaceae	*Ilex szechwanensis* Loes.		51, 53
Angiospermae	Dicotyledones	Aquifoliales	Aquifoliaceae	*Ilex pedunculosa* Miq.		22, 51
Angiospermae	Dicotyledones	Celastrales	Celastraceae	*Euonymus alatus* (Thunb.) Siebold		56
Angiospermae	Dicotyledones	Celastrales	Celastraceae	*Celastrus rosthornianus* Loes.		52
Angiospermae	Dicotyledones	Sapindales	Sapindaceae	*Acer caudatum* Wall.		51, 53, 56
Angiospermae	Dicotyledones	Sapindales	Sapindaceae	*Acer davidii* Franch.		51, 53
Angiospermae	Dicotyledones	Sapindales	Sapindaceae	*Acer oliverianum* Pax		20
Angiospermae	Dicotyledones	Geraniales	Balsaminaceae	*Impatiens blepharosepala* E.Pritz.		57
Angiospermae	Dicotyledones	Geraniales	Balsaminaceae	*Impatiens siculifer* Hook. f.		57
Angiospermae	Dicotyledones	Rhamnales	Rhamnaceae	*Berchemia kulingensis* C.K.Schneid.		57
Angiospermae	Dicotyledones	Rhamnales	Rhamnaceae	*Rhamnus lamprophylla* C.K.Schneid.		53
Angiospermae	Dicotyledones	Rhamnales	Rhamnaceae	*Rhamnus leptophylla* C.K.Schneid.		52
Angiospermae	Dicotyledones	Rhamnales	Vitaceae	*Ampelopsis glandulosa* var. *kulingensis* (Rehder) Momiyama		57
Angiospermae	Dicotyledones	Ericales	Actinidiaceae	*Actinidia chinensis* Planch		51
Angiospermae	Dicotyledones	Ericales	Theaceae	*Stewartia sinensis* Rehder & E.H.Wilson		53
Angiospermae	Dicotyledones	Malpighiales	Hypericaceae	*Hypericum attenuatum* Fisch. ex Choisy		57
Angiospermae	Dicotyledones	Violales	Violaceae	*Viola fargesii* H.Boissieu		21, 22
Angiospermae	Dicotyledones	Violales	Violaceae	*Viola moupinensis* Franch.		51
Angiospermae	Dicotyledones	Violales	Violaceae	*Viola arcuata* Blume		20, 21, 57
Angiospermae	Dicotyledones	Rosales	Elaeagnaceae	*Elaeagnus multiflora* Thunb.		57
Angiospermae	Dicotyledones	Rosales	Elaeagnaceae	*Elaeagnus lanceolata* Warb.		20

Phylum	Class	Order	Family	Species	Extinction Risk	Patches where found
Angiospermae	Dicotyledones	Myrtales	Onagraceae	*Epilobium pyrricholophum* Franch. & Sav.		52
Angiospermae	Dicotyledones	Myrtales	Onagraceae	*Epilobium parviflorum* Schreb.		57
Angiospermae	Dicotyledones	Apiales	Araliaceae	*Aralia chinensis* L.	VU	22
Angiospermae	Dicotyledones	Apiales	Araliaceae	*Hydrocotyle wilsonii* Diels ex Shan & S.L.Liou		56
Angiospermae	Dicotyledones	Apiales	Apiaceae	*Cryptotaenia japonica* Hassk.		20, 21
Angiospermae	Dicotyledones	Apiales	Apiaceae	*Oenanthe thomsonii* subsp. *Stenophylla* (H. de Boissieu) F.T.Pu		20, 21, 52, 56, 57
Angiospermae	Dicotyledones	Cornales	Cornaceae	*Cornus controversa* Hemsl.		51
Angiospermae	Dicotyledones	Cornales	Cornaceae	*Cornus kousa* subsp. *chinensis* (Osborn) Q.Y.Xiang		51
Angiospermae	Dicotyledones	Ericales	Ericaceae	*Chimaphila japonica* Miq.		21
Angiospermae	Dicotyledones	Ericales	Ericaceae	*Pyrola calliantha* Andres		53, 56
Angiospermae	Dicotyledones	Ericales	Ericaceae	*Lyonia ovalifolia* var. *elliptica* (Sieb.et Zucc.) Hand.-Mazz.		20, 21, 22, 51, 52, 53, 57
Angiospermae	Dicotyledones	Ericales	Ericaceae	*Enkianthus chinensis* Franch.		20, 22, 51, 52, 53, 56
Angiospermae	Dicotyledones	Ericales	Ericaceae	*Rhododendron auriculatum* Hemsl.		20, 22, 51, 52, 53, 57
Angiospermae	Dicotyledones	Ericales	Ericaceae	*Rhododendron hypoglaucum* Hemsl.		22, 56
Angiospermae	Dicotyledones	Ericales	Ericaceae	*Rhododendron mariesii* Hemsl. & E.H.Wilson		22
Angiospermae	Dicotyledones	Ericales	Ericaceae	*Rhododendron simsii* Planch.		52
Angiospermae	Dicotyledones	Ericales	Ericaceae	*Rhododendron stamineum* Franch.		51
Angiospermae	Dicotyledones	Ericales	Ericaceae	*Rhododendron sutchuenense* Franch.		20, 22, 51
Angiospermae	Dicotyledones	Primulales	Primulaceae	*Lysimachia punctatilimba* C.Y.Wu		20, 52, 57
Angiospermae	Dicotyledones	Primulales	Primulaceae	*Lysimachia rubiginosa* Hemsl.		20

Phylum	Class	Order	Family	Species	Extinction Risk	Patches where found
Angiospermae	Dicotyledones	Primulales	Primulaceae	*Lysimachia stenosepala* Hemsl.		20, 21, 57
Angiospermae	Dicotyledones	Primulales	Primulaceae	*Lysimachia clethroides* Duby		22
Angiospermae	Dicotyledones	Ericales	Symplocaceae	*Symplocos paniculata* Miq.		52, 57
Angiospermae	Dicotyledones	Ericales	Symplocaceae	*Symplocos sumuntia* Buch.-Ham. ex D.Don		57
Angiospermae	Dicotyledones	Gentianales	Gentianaceae	*Gentianopsis paludosa* var. *ovatodeltoidea* (Burkill) Ma		52, 53, 56, 57
Angiospermae	Dicotyledones	Gentianales	Gentianaceae	*Halenia elliptica* D.Don		20, 57
Angiospermae	Dicotyledones	Gentianales	Gentianaceae	*Tripterospermum chinense* (Migo) Harry Sm.		53, 56
Angiospermae	Dicotyledones	Gentianales	Apocynaceae	*Cynanchum wilfordii* (Maxim.) Hemsl.		57
Angiospermae	Dicotyledones	Gentianales	Apocynaceae	*Metaplexis japonica* (Thunb). Makino		22
Angiospermae	Dicotyledones	Laminales	Lamiaceae	*Clinopodium polycephalum* (Vaniot) C.Y.Wu & S.J.Hsuan		20, 57
Angiospermae	Dicotyledones	Laminales	Lamiaceae	*Lycopus cavaleriei* H.Léveillé		21, 52, 57
Angiospermae	Dicotyledones	Laminales	Lamiaceae	*Prunella vulgaris* L.		57
Angiospermae	Dicotyledones	Lamiales	Lamiaceae	*Salvia chinensis* Benth.		57
Angiospermae	Dicotyledones	Lamiales	Orobanchaceae	*Pedicularis fargesii* Franch.		20, 57
Angiospermae	Dicotyledones	Plantaginales	Plantaginaceae	*Plantago asiatica* L.		52
Angiospermae	Dicotyledones	Rubiales	Rubiaceae	*Galium aparine* L.		52, 53
Angiospermae	Dicotyledones	Rubiales	Rubiaceae	*Galium hoffmeisteri* (Klotzsch) Ehrend. & Schönb.-Tem. ex R.R.Mill		52, 53
Angiospermae	Dicotyledones	Rubiales	Rubiaceae	*Neanotis hirsuta* (L. f.) W.H.Lewis		22
Angiospermae	Dicotyledones	Rubiales	Rubiaceae	*Paederia foetida* L.		52
Angiospermae	Dicotyledones	Rubiales	Rubiaceae	*Rubia cordifolia* L.		51
Angiospermae	Dicotyledones	Dipsacales	Caprifoliaceae	*Lonicera acuminata* Wall.		20, 21, 51, 52, 57

Phylum	Class	Order	Family	Species	Extinction Risk	Patches where found
Angiospermae	Dicotyledones	Dipsacales	Caprifoliaceae	*Lonicera japonica* Thunb.		21
Angiospermae	Dicotyledones	Dipsacales	Caprifoliaceae	*Patrinia monandra* C.B.Clarke		57
Angiospermae	Dicotyledones	Dipsacales	Adoxaceae	*Viburnum betulifolium* Batalin		56
Angiospermae	Dicotyledones	Dipsacales	Adoxaceae	*Viburnum brachybotryum* Hemsl.		20, 56
Angiospermae	Dicotyledones	Dipsacales	Adoxaceae	*Viburnum erosum* Thunb.		53
Angiospermae	Dicotyledones	Dipsacales	Adoxaceae	*Viburnum foetidum* Wall.		52
Angiospermae	Dicotyledones	Dipsacales	Adoxaceae	*Viburnum hupehense* Rehder		21
Angiospermae	Dicotyledones	Dipsacales	Adoxaceae	*Viburnum macrocephalum* Fortune		52
Angiospermae	Dicotyledones	Dipsacales	Adoxaceae	*Viburnum rhytidophyllum* Hemsl.		57
Angiospermae	Dicotyledones	Dipsacales	Adoxaceae	*Viburnum setigerum* Hance		52
Angiospermae	Dicotyledones	Campanulales	Campanulaceae	*Codonopsis pilosula* (Franch.) Nannf.		51
Angiospermae	Dicotyledones	Asterales	Compositae	*Achillea wilsoniana* (Heimerl) Hand.-Mazz.		57
Angiospermae	Dicotyledones	Asterales	Compositae	*Anaphalis margaritacea* (L) Benth. & Hook. f.		21
Angiospermae	Dicotyledones	Asterales	Compositae	*Anaphalis margaritacea* subsp. *Japonica* (Maxim.) Kitam.		57
Angiospermae	Dicotyledones	Asterales	Compositae	*Galinsoga parviflora* Cav.		51
Angiospermae	Dicotyledones	Asterales	Compositae	*Inula hupehensis* (Ling) Ling		57
Angiospermae	Dicotyledones	Asterales	Compositae	*Inula japonica* Thunb.		20
Angiospermae	Dicotyledones	Asterales	Compositae	*Ligularia intermedia* Nakai		21, 57
Angiospermae	Dicotyledones	Asterales	Compositae	*Stenoseris graciliflora* (Wall. ex DC.) C.Shih		20
Angiospermae	Dicotyledones	Asterales	Compositae	*Youngia japonica* (L.) DC.		57
Angiospermae	Monocotyledones	Dioscoreales	Nartheciaceae	*Aletris glabra* Bureau & Franch.		57
Angiospermae	Monocotyledones	Dioscoreales	Nartheciaceae	*Aletris spicata* (Thunb.) Franch.		20, 56

Phylum	Class	Order	Family	Species	Extinction Risk	Patches where found
Angiospermae	Monocotyledones	Liliflorae	Liliaceae	*Heterosmilax japonica* Kunth		51
Angiospermae	Monocotyledones	Liliflorae	Liliaceae	*Paris polyphylla* var. *yunnanensis* (Franch.) Hand.-Mzt.		52
Angiospermae	Monocotyledones	Liliflorae	Liliaceae	*Polygonatum sibiricum* F.Delaroche		53
Angiospermae	Monocotyledones	Liliales	Liliaceae	*Tricyrtis maculata* (D.Don) J.F.Macbr.		52, 57
Angiospermae	Monocotyledones	Asparagales	Asparagaceae	*Hosta ventricosa* Stearn		20, 21, 52, 53, 57
Angiospermae	Monocotyledones	Liliales	Smilacaceae	*Smilax nigrescens* F.T.Wang & Tang		51
Angiospermae	Monocotyledones	Liliales	Smilacaceae	*Smilax stans* Maxim.		52, 56
Angiospermae	Monocotyledones	Graminaceae	Gramineae	*Deyeuxia pyramidalis* (Host) Veldkamp		56, 57
Angiospermae	Monocotyledones	Graminaceae	Gramineae	*Deyeuxia hakonensis* (Franch. et Sav.) Keng		20, 52
Angiospermae	Monocotyledones	Graminaceae	Gramineae	*Fargesia spathacea* Franch.		22, 51
Angiospermae	Monocotyledones	Graminaceae	Gramineae	*Indocalamus longiauritus* Hand. -Mazz.		51
Angiospermae	Monocotyledones	Graminaceae	Gramineae	*Miscanthus sinensis* Andersson		57
Angiospermae	Monocotyledones	Graminaceae	Gramineae	*Oplismenus undulatifolius* (Ard.) Roem. & Schult.		57
Angiospermae	Monocotyledones	Juncales	Juncaceae	*Juncus bufonius* L.		20, 53, 57
Angiospermae	Monocotyledones	Juncales	Juncaceae	*Juncus setchuensis* Buchen. ex Diels		20, 21, 51, 52
Angiospermae	Monocotyledones	Juncales	Juncaceae	*Luzula effusa* Buchenau		20, 53, 56
Angiospermae	Monocotyledones	Cyperales	Cyperaceae	*Carex cinerascens* Kük.		56
Angiospermae	Monocotyledones	Cyperales	Cyperaceae	*Carex japonica* Thunb.		53, 56, 57
Angiospermae	Monocotyledones	Cyperales	Cyperaceae	*Carex fargesii* Franch.		20, 51, 57
Angiospermae	Monocotyledones	Cyperales	Cyperaceae	*Carex filicina* Nees		53
Angiospermae	Monocotyledones	Cyperales	Cyperaceae	*Carex rubrobrunnea* var. *taliensis* (Franchet) Kukenthal		20, 22, 51, 52, 53, 57

Phylum	**Class**	**Order**	**Family**	**Species**	**Extinction Risk**	**Patches where found**
Angiospermae	Monocotyledones	Cyperales	Cyperaceae	*Scirpus lushanensis* Ohwi		20, 57
Angiospermae	Monocotyledones	Cyperales	Cyperaceae	*Scirpus mucronatus* L.		57
Angiospermae	Monocotyledones	Acorales	Acoraceae	*Acorus calamus* L.		57
Angiospermae	Monocotyledones	Arales	Araceae	*Arisaema erubescens* (Wall.) Schott		20, 53, 56, 57
Angiospermae	Monocotyledones	Arales	Araceae	*Arisaema lobatum* Engl.		56
Angiospermae	Monocotyledones	Orchidales	Orchidaceae	*Gastrodia elata* Blume	VU	22
Angiospermae	Monocotyledones	Orchidales	Orchidaceae	*Goodyera repens* (L.) R.Br.		53
Angiospermae	Monocotyledones	Orchidales	Orchidaceae	*Habenaria davidii* Franch.		53
Angiospermae	Monocotyledones	Orchidales	Orchidaceae	*Pleione bulbocodioides* (Franch.) Rolfe		56
Angiospermae	Monocotyledones	Farinosae	Pontederiaceae	*Eichhornia crassipes* (Mart.) Solms		22

Table A2. List of bird species recorded in the peatland of Qizimei Mountain National Nature Reserve. Extinction risk abbreviations follow IUCN Red List categories: NT-Near Threatened, VU-Vulnerable, EN-Endangered, CR-Critically Endangered.

Order	**Family**	**Species**	**Common name**	**Extinction Risk**
Ciconiiformes	Ardeidae	*Egretta garzetta*	Little Egret	
Ciconiiformes	Ardeidae	*Ardea cinerea*	Grey Heron	
Ciconiiformes	Ardeidae	*Nycticorax nycticorax*	Night Heron	
Falconiformes	Accipitridae	*Milvus migrans*	Pariah Kite	
Falconiformes	Accipitridae	*Accipiter virgatus*	Japanese Sparrowhawk	
Galliformes	Phasianidae	*Bambusicola thoracica*	Chinese Bamboo Partridge	
Galliformes	Phasianidae	*Tragopan temminckii*	Chinese Pheasant	
Galliformes	Phasianidae	*Phasianus colchicus*	Pheasant	
Galliformes	Phasianidae	*Chrysolophus pictus*	Golden Pheasant	
Columbiformes	Columbidae	*Streptopelia orientalis*	Oriental Turtle-Dove	
Columbiformes	Columbidae	*Streptopelia Tranquebarica*	Common Crane	
Columbiformes	Columbidae	*Treron sieboldii*	White-Bellied Green-Pigeon	
Cuculiformes	Cuculidae	*Hierococcyx sparverioides*	Large Hawk-Cuckoo	
Cuculiformes	Cuculidae	*Cuculus canorus*	Common Cuckoo	
Cuculiformes	Cuculidae	*Eudynamys scolopacea*	Asian Koels	
Strigiformes	Tytonidae	*Tyto capensis*	African Grass Owl	
Strigiformes	Strigidae	*Bubo bubo*	Eurasian Eagle-Owl	
Coraciiformes	Alcedinidae	*Alcedo atthis*	Common Kingfisher	
Piciformes	Capitonidae	*Megalaima virens*	Great Barbet	
Piciformes	Picidae	*Picus canus*	Grey-Headed Woodpecker	
Passeriformes	Hirundinidae	*Cecropis daurica*	Red-Rumped Swallow	
Passeriformes	Motacillidae	*Motacilla alba*	White Wagtail	
Passeriformes	Pycnonotidae	*Spizixos semitorques*	Collared Finchbill	

Order	Family	Species	Common name	Extinction Risk
Passeriformes	Pycnonotidae	*Pycnonotus xanthorrhous*	Brown-Breasted Bulbul	
Passeriformes	Dicruridae	*Dicrurus hottentottus*	Hair-Crested Drongo	
Passeriformes	Corvidae	*Garrulus glandarius*	Eurasian Jay	
Passeriformes	Corvidae	*Urocissa erythrorhyncha*	Red-Billed Blue Magpie	
Passeriformes	Corvidae	*Corvus macrorhynchos*	Large-Billed Crow	
Passeriformes	Turdidae	*Turdus rubrocanus*	Grey-Headed Thrush	
Passeriformes	Turdidae	*Phoenicurus auroreus*	Daurian Redstart	
Passeriformes	Turdidae	*Rhyacornis fuliginosus*	Plumbeous Water Redstart	
Passeriformes	Turdidae	*Enicurus leschenaulti*	White-Crowned Forktail	
Passeriformes	Timaliidae	*Garrulax albogularis*	White-Throated Laughingthrush	
Passeriformes	Timaliidae	*Garrulax ocellatus*	Spotted Laughingthrush	
Passeriformes	Timaliidae	*Garrulax sannio*	White-Browed Laughingthrush	
Passeriformes	Timaliidae	*Leiothrix lutea*	Red-Billed Leiothrix	
Passeriformes	Timaliidae	*Yuhina diademata*	White-Collared Yuhina	
Passeriformes	Paradoxornithidae	*Paradoxornis webbianus*	Vinous-Throated Parrotbill	
Passeriformes	Sylviidae	*Cettia fortipes*	Brownish-Flanked Bush Warbler	
Passeriformes	Muscicapidae	*Eumyias thalassina*	Verditer Flycatcher	
Passeriformes	Paridae	*Parus major*	Great Tit	
Passeriformes	Paridae	*Parus monticolus*	Green-Backed Tit	
Passeriformes	Ploceidae	*Passer rutilans*	Black-Throated Parrotbill	
Passeriformes	Passeridae	*Carpodacus vinaceus*	Vinaceous Rosefinch	
Passeriformes	Emberizidae	*Emberiza pusilla*	Little Bunting	
Anseriformes	Anatidae	*Aix galericulata*	Mandarin Duck	
Anseriformes	Anatidae	*Anas formosa*	Baikal Teal	

Table A3. List of fish species recorded in the peatland of Qizimei Mountain National Nature Reserve. Extinction risk abbreviations follow IUCN Red List categories: NT-Near Threatened, VU-Vulnerable, EN-Endangered, CR-Critically Endangered.

Order	**Family**	**Species**	**Extinction Risk**
Cypriniformes	Cyorinidae	*Zacco platypus*	
Cypriniformes	Cyorinidae	*Squaliobarbus curriculus*	
Cypriniformes	Cyorinidae	*Ochetobius elongatus*	
Cypriniformes	Cyorinidae	*Chanodichthys oxycephalus*	
Cypriniformes	Cyorinidae	*Parabramis pekinensis*	
Cypriniformes	Cyorinidae	*Xenocypris argentea*	
Cypriniformes	Cyorinidae	*Xenocypris microlepis*	
Cypriniformes	Cyorinidae	*Rhodeus ocellatus*	
Cypriniformes	Cyorinidae	*Acrossocheilus yunnanensis*	
Cypriniformes	Cyorinidae	*Onychostoma simum*	
Cypriniformes	Cyorinidae	*Rectoris luxiensis*	
Cypriniformes	Cyorinidae	*Sarcocheilichthys nigripinnis*	
Cypriniformes	Cyorinidae	*Abbottina rivularis*	
Cypriniformes	Cyorinidae	*Schizothorax prenanti*	
Cypriniformes	Cyorinidae	*Carassius auratus*	
Cypriniformes	Cobitidae	*Misgurnus anguillicaudatus*	
Cypriniformes	Cobitidae	*Botia superciliaris*	
Cypriniformes	Cobitidae	*Leptobotia tientainensis*	
Cypriniformes	Cobitidae	*Triplophysa grahami*	
Cypriniformes	Cobitidae	*Paracobitis variegatus*	
Cypriniformes	Homalopteridae	*Sinogastromyzon szechuanensis*	
Cypriniformes	Homalopteridae	*Lepturichthys fimbriata*	
Cypriniformes	Homalopteridae	*Metahomaloptera omeiensis*	
Cyprinodontiformes	Poeciliidae	*Gambusia affnis*	
Siluriformes	Bagridae	*Tachysurus fulvidraco*	

Table A4. List of Amphibia and Reptilia species record in the peatland of Qizimei Mountain National Nature Reserve. Extinction risk abbreviations follow IUCN Red List categories: NT-Near Threatened, VU-Vulnerable, EN-Endangered, CR-Critically Endangered.

Order	**Family**	**Species**	**Common name**	**Extinction Risk**
Caudata	Hynobidae	*Pseudohynobius flavomaculatus*		VU
Caudata	Cryptobranchidae	*Andrias davidianus*	Chinese giant salamander	CR
Anura	Bufonidae	*Bufo gargarizans*	Chinese toad	
Anura	Bufonidae	*Bufo gargarizans andrezusi*	Asian toad	
Anura	Ranidae	*Rana omeimontis*	Omei brown frog / Omei wood frog	
Anura	Ranidae	*Quasipaa spinosa*	Chinese spiny frog	VU
Anura	Ranidae	*Rana boulengeri*	Spiny-bellied frog	
Anura	Rhacophoridae	*Polypedates chenfui*		
Serpentiformes	Colupridae	*Elaphe carinata*	King rat snake/ Stink rat snake	
Serpentiformes	Colupridae	*Amphiesma craspedogaster*		
Serpentiformes	Colupridae	*Zaocys dhumnades*		
Serpentiformes	Crotalinae	*Protobothrops jerdonii*		
Serpentiformes	Crotalinae	*Viridovipera stejnegeri*		

Table A5. List of mammal species recorded in the peatland of Qizimei Mountain National Nature Reserve. Extinction risk abbreviations follow IUCN Red List categories: NT-Near Threatened, VU-Vulnerable, EN-Endangered, CR-Critically Endangered.

Order	**Family**	**Species**	**Common name**	**Extinction Risk**
Insectivora	Mustelidae	*Melogale moschata*	Chinese ferret badger	
Insectivora	Viverridae	*Paguma larvata*	Masked palm civet	
Artiodactyla	Cervidae	*Muntiacus reevesi*	Chinese muntjac	
Artiodactyla	Cervidae	*Elaphodus cephalophus*	Tufted deer	NT
Artiodactyla	Moschidae	*Moschus berezovskii*	Forest musk deer	EN
Rodentia	Sciuridae	*Tamiops swinhoei*	Red-bellied tree squirrel	
Rodentia	Petauristidae	*Trogopterus xanthipes*	Complex-toothed flying squirrel	NT
Rodentia	Petauristidae	*Petaurista alborufus*	Japanese giant flying squirrel	
Rodentia	Rhizomyidae	*Rhizomys sinensis*	Chinese bamboo rat	
Rodentia	Hystricidae	*Hystrix brachyura*	Fossil porcupine	
Lagomorpha	Leporidae	*Lepus capensis*	Cape hare	