

Threatened Birds of Asia:

The BirdLife International Red Data Book

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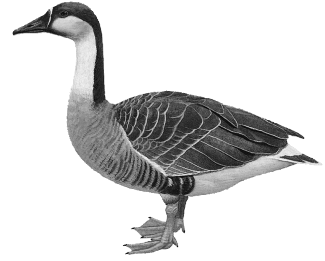
SWAN GOOSE

Anser cygnoides

Critical —

Endangered **A1a,c,d; A2b,c,d**

Vulnerable —



This flock-forming migrant large waterbird has a very rapidly declining population as a result of habitat loss, particularly to agricultural development, and unsustainable levels of hunting. It therefore qualifies as Endangered.

DISTRIBUTION The Swan Goose (see Remarks 1) breeds in eastern Russia, Mongolia and north-east China, and it is suspected that it may also breed in North Korea. On passage, large flocks have been found in central Mongolia, along the western coast of North and South Korea and in northern China. There are also some records from outside the Asian region in north-east Kazakhstan and Uzbekistan (Dement'ev and Gladkov 1951–1954, Kreuzberg-Mukhina *et al.* 2000). The main wintering areas are along the eastern coast of China and the lower Yangtze valley, and smaller numbers winter elsewhere in China, and in Japan, South Korea and on Taiwan; there is also a single record from Thailand.

■ **RUSSIA** In the nineteenth century and the first half of the twentieth century, the Swan Goose inhabited a continuous range in eastern Russia, from the southern Altai in the west to the lower Amur river and the Uda basin in the north-east, and from northern Sakhalin south to the Khanka lowlands (see Dement'ev and Gladkov 1951–1954). However, since the 1950s its range has rapidly collapsed and has become highly fragmented; in Russia, it now occurs mainly on the Torey lakes, in the Ul'ma basin, in the lower Amur region, on northern Sakhalin and at Lake Khanka (N. D. Poyarkov *in litt.* 1999).

It has been recorded breeding in Khakassia, Buryatia, Chita, Khabarovsk, Amur and Primorye and on Sakhalin island, and it may have bred in the past in Kamchatka. It has also been recorded on passage in the Jewish Autonomous Region and as a rare visitor to the Kuril islands. There is evidence that it has declined in many parts of its range. For example, it has disappeared from Kizi lake in Khabarovsk (B. A. Voronov *in litt.* 1997), by the late 1970s its range on Sakhalin covered less than half of the area that it occupied in the 1920s and 1930s (Nechaev 1991), and it has obviously declined in Primorye (N. M. Litvinenko *in litt.* 1997). Moreover, the species formerly nested in the north-western Minusinsk depression (Yanushevich and Yurlov 1950 in Rogacheva 1988, 1992), but it has been reported to no longer breed anywhere in Khakassia (Prokof'ev 1987 in Rogacheva 1992). Records (by province) are as follows:

■ **Khakassia** **Bele lake**, north-western Minusinsk depression, rare breeding species, undated (Sushkin 1914 in Rogacheva 1992); **Irengol lake**, north-western Minusinsk depression, rare breeding species, undated (Sushkin 1914 in Rogacheva 1992); **Chernoye lake**, north-western Minusinsk depression, rare breeding species, undated (Sushkin 1914 in Rogacheva 1992), one with Greylag Geese *Anser anser*, May 1975 (Rogacheva 1992); **Beyskiy district** (Beysk district), two collected from a flock of eight, autumn 1982 (Rogacheva 1992);

■ **Buryatia** **Baikal lake**, April 1873, August 1884, February 1885, May (before 1887), October 1898 and July 1944 (six specimens in BMNH); **Selenga delta**, breeding, presumably in the 1970s (Vasil'chenko 1987, 1988); **Khamar-Daban** area, rare on migration in the 1940s (Vasil'chenko 1987, 1988);

■ **Chita** **Torey lakes** (Toreisk lake), six nests, undated (Khrabry 1989; also Flint 1984, E. E. Tkachenko *in litt.* 1997);

■ **Kamchatka** (where it probably bred in the nineteenth century: Taczanowski 1891–1893) **Commander islands**, occasional visitor, undated (Johansen 1936 in Gizenko 1955); **Semlyachik lagoon** (Semyachick lagoon), south-east Kamchatka, one, an occasional winter visitor, undated (Markov 1963);

■ **Khabarovsk Ul'bansky bay**, Tuguro-Chumikanskiy district, south-west Sea of Okhotsk area, more than 200 moulting birds, August 1989, probably breeding (Voronov and Pronkevich 1991a), breeding in the Ul'bansky lowland, undated (Miyabayashi and Mundkur 1999); **Ul'ban river mouth**, c.70 adults and juveniles, August 1996 (Masterov and Poyarkov 1997); **Usalgin river mouth**, some during aerial surveys, September 1996 (Masterov and Poyarkov 1997); **Schast'ya bay**, Chernaya Rechka hunting reserve, Nikolaevskiy district, 2–3 breeding pairs, 1981–1982 (Roslyakov 1984); **Langr island** and Ush island, Amur river mouth, commonly observed, undated (Stakhanov 1935 in Gizenko 1955); near **Mago** settlement, 30 km upstream of Nikolaevsk-on-Amur, Nikolaevskiy district, rare breeding species, one pair, June 1961 (Kistiyakovskiy and Smogorzhevskiy 1973); Chernaya river, near **Puir** settlement, lower Amur, flock of “several hundreds” reported by local wardens, August 1979 (Poyarkov and Babenko 1987); **Chertovo lake**, lower Amur river, between Orel' and Daldzha lakes, 4–5 adults and 20 goslings, July 1980 (Poyarkov and Babenko 1987); middle reaches of the **Bichi river**, tributary of Udył' lake, 20 moulting birds on the river in 1979 (Roslyakov 1979, Poyarkov and Babenko 1991); **Bichi river mouth**, 150 individuals including 60 goslings in 1979 (Poyarkov and Babenko 1991); lower **Alochka river** and lower Pil'da river, south-western Udył' lake basin, Ul'chskiy district, rare breeding species in the “mari” (wooded swamps) and small lakes on the riverine floodplains, c.150 breeding pairs, undated (Roslyakov 1981b), c.40 pairs in 1981 (B. A. Voronov *in litt.* 1997); **Udył' lake** basin, 350 km north-east of Komsomol'sk-on-Amur, Ul'chskiy district, rare breeding species, undated (Roslyakov 1979, 1987b), 80–180 birds at Udył' lake, 1978 (Smirenskiy and Mitschenko 1980), c.340 breeding birds in 1979 (Miyabayashi and Mundkur 1999), c.150 breeding pairs, undated (Khrabry 1989); **Chukchagirskoye lake**, 200 km north of Komsomol'sk-on-Amur, Polina Osipenko district, occasionally seen and probably breeds, undated (Roslyakov 1984, 1987b); **Pil'da river**, south-western Udył' lake basin, Ul'chskiy district, rare breeding species in the “mari” (wooded swamps) and small lakes on the riverine floodplains, c.150 breeding pairs, undated (Roslyakov 1981b), c.40 pairs in 1981 (B. A. Voronov *in litt.* 1997), at the Pil'da river mouth, 25 adults in 1979, 120–130 birds in 1983 (Poyarkov and Babenko 1991); **Kizi lake**, near Mariinskoe village, lower Amur, Ul'chskiy district, formerly a common breeding species, 10 birds shot, August 1932 (Vorob'ev 1954); **Kholan channel**, at least 10–14 breeding pairs in 1996 (Masterov and Poyarkov 1997); **Evoron lake**, 150 km north of Komsomol'sk-on-Amur, Solnechniy district, occasionally seen and probably breeds, undated (Roslyakov 1984, 1987b); **Bolon' lake**, 300 km north-east of Khabarovsk, Amurskiy district, rare spring passage migrant (unspecified years) (Roslyakov 1987b); 350 km north-east of Komsomol'sk-on-Amur (not mapped), rare breeding species on the “mari”, undated (Roslyakov 1984);

■ **Amur Ul'ma river** floodplain, Konstantinovskiy district, nest found, May 1972 (Kislenko *et al.* 1990); between Konstantinovka and **Poyarkovo** villages, Amur valley, two nests reported by local people, 1990–1995 (V. A. Dugintsov *in litt.* 1997); between the **Bureya river** (Bureia river) and Amur river, flocks of 3–15 birds recorded annually on spring migration (data *per* AVA);

■ **Jewish Autonomous Region** island formed by the **Osinovaya channel** and the main channel of the Amur river, 30 km upstream of Khabarovsk, Smidovichskiy district, rare migrant by a lake on the island, pair in April 1990 (B. A. Voronov *in litt.* 1997);

■ **Primorye** lower **Iman river**, rare passage migrant, six, May 1938 (Spangenberg 1965); Khanka lake, the only breeding site in Primorye, where it was a common breeding species in the late nineteenth century (Przheval'skiy in Shul'pin 1936) but later an irregular breeding species (Spangenberg 1965) and currently only occasionally occurring on passage and in summer

on the **Sungacha lakes** (Sungach lakes) and at the **Lefu river mouth** (Polivanova 1971), with a pair and six flying young at the **Verkhniy Sungach river mouth**, August 1976 (Glushchenko 1981); **Suyfun river mouth**, rare passage migrant, flock of nine, March 1986, one, April 1989 (Gorchakov 1996); extreme south of **Khasanskiy district**, rare passage migrant (unspecified years) (Shibaev 1974);

■ **Sakhalin** headwaters of the **Pil'tun river**, northern Sakhalin, undated (Nechaev 1991); headwaters of the **Val river**, northern Sakhalin, undated (Nechaev 1991); c.200 breeding birds in the north-west Sakhalin lowlands, undated (Miyabayashi and Mundkur 1999), and a common breeding species in northern Sakhalin south to the **Khoyambusibin river** (Khoya river) (Gizenko 1955, Nechaev 1991); headwaters of the **Askasai river**, northern Sakhalin, undated (Nechaev 1991); **Vagis river** basin, western Sakhalin, undated (Nechaev 1991); **Pogibi river** basin, western Sakhalin, undated (Nechaev 1991); **Bol'shaya Uangi river** basin, western Sakhalin, undated (Nechaev 1991); **Lakh river** basin, western Sakhalin, undated (Nechaev 1991); **Tym' river** drainage, numerous, undated (Gizenko 1955, Nechaev 1991); **Tyk bay**, between the Varnak river mouth and the Tyk river mouth, north-west coast of Sakhalin, flock of 18–25 birds and 2–5 breeding pairs on lakes and bogs 2–3 km inland, June 1984, 30–50 breeding pairs in 1984–1986 (Nechaev 1991), recorded during aerial surveys in summer 1998 (V. Masterov *per* AVA); **Tyk river** basin, western Sakhalin, undated (Nechaev 1991); **Viakhtu river** basin, western Sakhalin, undated (Nechaev 1991); **Nabil'skiy bay** and **Lun'skiy bay**, probably breeding on the shoreline, undated (Nechaev 1991), but (according to the results of a questionnaire survey) not present in the valleys on the north-eastern coast of the island from Lun'sky bay to Shmidt peninsula in 1988–1991 (Blokhin 1998a), and not found in the area between the Pogibi and Lakh rivers in summer 1990 (N. D. Poyarkov *in litt.* 1999); **Poronay river** drainage, numerous, undated (Gizenko 1955, Nechaev 1991); **Mauka**, before 1937 (specimen in YIO);

■ **Kuril islands** passage migrant on central and southern islands of the chain (unspecified years) (Snow 1897, OSJ 2000), “vagrant”, undated (Nechaev 1991).

■ **MONGOLIA** It is a fairly common breeding visitor to most of the larger lakes and rivers in northern Mongolia and to the Gobi lakes (A. Bräunlich *in litt.* 2000), with records (by province) as follows: ■ **Uvs Uvs Nuur** (Tes-Khem lake), near the Russia–Mongolia border, 30 km south of Tsagan-Tolongoi, two adults and three juveniles on a river bank, July 1969 (data *per* AVA); **Ayrag Nur**, 510 adults and 40 crèches, July 1995 (A. Bräunlich *in litt.* 2000), 35 adults and many chicks, June 1996 (M. Köpman *per* A. Bräunlich *in litt.* 2000); ■ **Bayan-Ölgii Achit Nuur**, August 1910 (two specimens in BMNH), six adults and three crèches (of 3–4 pulli each), June 1968 (data *per* AVA); ■ **Khovd Chono KharaiKh river**, four adults, May 1995 (A. Bräunlich *in litt.* 2000); **Khar Us Nuur National Park** (Char-us-nur, Har Us Nuur), two birds, July (unspecified year) (Piechocki 1968), 40 adults and several tens of goslings, July 1975 (data *per* AVA), seen near Khar Us Nuur, in the valley of the Khovd river, in August–October 1996 (Kováts *et al.* undated), four adults and one crèche at Khovd Gol Delta/Khar Us Nuur, June 1995 (A. Bräunlich *in litt.* 2000); Dalai Nuur lake (untraced), 10 adults, May 1995 (A. Bräunlich *in litt.* 2000); Khovd Gol river (untraced), eight adults, May 1995 (A. Bräunlich *in litt.* 2000); ■ **Dzavkhan Oigon Nuur** lake, flock of 12 and a pair with two goslings, June 1977 (Kitson 1978); **Telmen-nur** lake, 24 birds, August (unspecified year) (Piechocki 1968); **Dzavkhan** (Zavchan) lowlands, 52 adults with more than 80 half-grown young on a large water body, June (unspecified year) (Piechocki 1968); ■ **Khövsgöl Selenge river**, 11 birds, August 1964 (Piechocki 1968); ■ **Arkhangai Ögiy Nuur** (Ugiy-Nur), several nests found, June 1975 (data *per* AVA), 300 birds in June 1977 and 1,000 in July 1977, including four pairs with a crèche of 20 goslings on the latter date (Kitson 1978), 20 birds and some pairs nesting, May 1996 (M. Köpman *per* A. Bräunlich *in litt.* 2000), 16 birds, September 1998 (Buckton *et al.* 1998); **Doityn Tsagaan Nuur**, 6,000 migrating birds reported,

May 1996 (Batdelger 1996); ■ **Bayankhongor Boon Tsagaan Nur**, one bird, September 1998 (Buckton *et al.* 1998), 170 birds in family parties (including pulli) at the northern end of the lake, June 2000 (A. Bräunlich *in litt.* 2000, *Oriental Bird Club Bull.* 32 [2000]: 66–76); **Davs Nuur**, two birds, May 1977 (Kitson 1978); **Orog Nuur** (Orok Nor), 10 nests with eggs found on a small island in the lake, May (unspecified year) (Kozlova 1932–1933), pair with five young, May (unspecified year) (Piechocki 1968), 10 birds, May 1977 (Kitson 1978), 29 birds in the grazing marshes at the west end of the lake, September 1998 (Buckton *et al.* 1998), 82 birds on the eastern shores of the lake, June 2000 (A. Bräunlich *in litt.* 2000, *Oriental Bird Club Bull.* 32 [2000]: 66–76); ■ **Bulgan Tsagaan Nuur**, six birds, May 1996 (M. Köpman *per A.* Bräunlich *in litt.* 2000); ■ **Töv Tola river, near Öndörshireet** (Under-Schiret, Undershireet), two birds, April 1979 (Stephan 1994); ■ **Dornod Büse Nuur** (Bus Nuur), 11 adults and one crèche, June 1998 (A. Bräunlich *in litt.* 2000); **Mongol Daguur Strictly Protected Area**, regular breeding bird and summer visitor (unspecified years) (Tsevenmyadag 1998); **Khökh Nuur**, four adults, June 1998 (A. Bräunlich *in litt.* 2000); **Uldz river**, eight family parties, June 1988 (Stephan 1994); **Khaichiin Tsagaan Nuur** (Khaikhen Tsaagan Nuur), 20 adults and three crèches, June 1998 (A. Bräunlich *in litt.* 2000); Kherulen river (Kherlen Gol), between **Bayan Tumen** and Choibalsan, four birds, May 1979 (Stephan 1994); Kherulen river near **Choibalsan**, four pairs, June 1998 (A. Bräunlich *in litt.* 2000); **Bayan Nuur**, six adults, June 1999 (A. Bräunlich *in litt.* 2000); **Numrug Strictly Protected Area** (Nömörög), rare breeding bird and summer visitor (unspecified years) (Tsevenmyadag 1998); **Eastern Mongolia Strictly Protected Area**, rare passage migrant and summer visitor (unspecified years) (Tsevenmyadag 1998); Doroo Nuur (untraced), 62 adults and two crèches, June 1998 (A. Bräunlich *in litt.* 2000); Khavtgai Us (untraced), Khalkhyn Gol, 236 adults and one crèche, June 1999 (A. Bräunlich *in litt.* 2000).

■ **JAPAN** The species was widespread and relatively numerous in Japan until the 1920s, but it is now is a rare passage and winter visitor (N. Yanagisawa *in litt.* 1998), mainly to western and southern Japan. Records (by island and province) are as follows:

Hokkaido ■ **Kamikawa**, undated (Wildlife Information Center, Hokkaido 1985); **Miyajima-ura**, Bibai-shi, one, April 1986 (WBSJ 1986); **Akkeshi lake**, winter 1977 (Takano 1981); **Ishikari**, undated (Wildlife Information Center, Hokkaido 1985); **Sapporo**, winter 1970 (Takano 1981); Mikazuki-numa lake, Aiushi, **Urahoru-cho**, Tokachi-gun, one, October 1996 (*Birder* 97/1); **Lake Utonai** (Utonai-ko), Tomakomai-shi, six, October 1984 (WBSJ 1986); Seika-ko lake (untraced), one, April–May 1981 (probably the same bird that wintered at Izu-numa, Miyagi prefecture) (Kurechi *et al.* 1982);

Honshu ■ **Aomori Tsuruta-machi**, Kitatsugaru-gun, one, March 1998 (WBSJ Hirosaki Chapter database); ■ **Miyagi Izu-numa lake**, one with White-fronted Geese *Anser albifrons*, October 1980 to January 1981 (Kurechi *et al.* 1982); **Hasama-cho**, Tome-gun, one, October 1980 (WBSJ Miyagi Chapter database); ■ **Akita Hachiro-gata**, one, March 1981 (probably the same bird that wintered at Izu-numa, Miyagi prefecture) (Kurechi *et al.* 1982); ■ **Yamagata** unspecified locality, winter 1975 (Takano 1981); ■ **Fukushima** unspecified localities, undated (OSJ 2000); ■ **Gunma** unspecified localities, formerly a winter visitor, not recorded since 1965 (Ugi 1973); ■ **Saitama Sasai-zeki, Sayama-shi**, October 1997 (*Birder* 97/12); ■ **Chiba Higashikatsushika-gun**, December 1883 and March 1932 (two specimens in YIO); **Tega-numa lake**, 40–50 birds, January 1937 (Kuroda 1939); **Gyotoku** (Minami Gyotoku), c.12 seen and two collected, November 1934 (Kuroda 1939); **Tokyo bay**, formerly a winter visitor (WBSJ 1975); **Wada-numa lake**, two collected, 1934 and 1935 (Kuroda 1939); ■ **Tokyo** western side of **Arakawa channels**, seven, May 1931 (Kuroda 1939); ■ **Kanagawa Yokohama**, before 1883 (specimen in BMNH); ■ **Niigata Kanai-machi**, Sado island, one, January 1990 (WBSJ 1990); **Sado island**, two, January 1990 (Environment Agency of Japan 1988–1997); **Fukushima-gata**, Toyosaka-shi, one, November 1995 (WBSJ 1997a), one, January 1996 (Environment Agency

of Japan 1988–1997); **Asahi-ike** pond, Joetsu area, one, October 1991 (Nakamura 1994); ■ **Toyama Kurobe-gawa river mouth**, Nyuzen-machi, Shimoniikawa-gun, October 1989 (WBSJ Toyama Chapter database); ■ **Ishikawa Kaga-shi**, December 1967, one at Katano duck pond, February 1999 (Ohata and Yamamoto 1999), one at Katano duck pond, January 2000 (Ohata and Yamamoto 2000b); ■ **Gifu Ono-gun**, May 1937 (Y. Sakai *in litt.* 1998); Kiso-gawa river, Masaki-cho, **Hashima-shi**, one, October 1995 (Y. Sakai *in litt.* 1998); ■ **Aichi Tahara-cho**, Atsumi-gun, one, October 1995 (WBSJ 1997a); ■ **Kyoto Kumihama bay**, Kumi-cho, one, April 1988 (WBSJ 1988); ■ **Hyogo** unspecified locality, winter 1956 (Takano 1981); ■ **Tottori Koyama-ike** pond, Tottori-shi, October 1987 (Shimoda *in litt.* 1998); **Nakano-umi** lake, one, January 1990, one, January 1996 (Environment Agency of Japan 1988–1997); Ogamo-gawa river, Tauchi, Iwaki, **Kurayoshi-shi**, February 1986 (Hosoya *in litt.* 1998); ■ **Shimane Nishinoshima-cho**, Oki islands, one, January 1991 (Environment Agency of Japan 1988–1997); **Iinashi-gawa river mouth**, Yasugi-shi, February 1996 (Y. Motoyoshi *in litt.* 1998); **Hii-gawa river mouth**, Hirata-shi, one, November 1997 (*Birder* 98/2); ■ **Hiroshima Saijo-cho**, Higashihiroshima-shi, one, September–October 1998 (*Birder* 98/12); ■ **Yamaguchi Yuya bay**, Yuya-cho, Otsu-gun, November 1986 to February 1987 (WBSJ Yamaguchi Chapter database); Kiya-gawa river mouth, **Shimonoseki-shi**, one, December 1973 (WBSJ Yamaguchi Chapter 1976); **Nishiura**, Hofu-shi, one, October 1975 (WBSJ Yamaguchi Chapter 1976); **Ajisu reclamation**, Ajisu-cho, Yoshiki-gun, one, November–December 1998 (*Birder* 99/1, 99/2);

Shikoku ■ **Tokushima** Shishikui-gawa river mouth, **Shishikui-cho**, Kaifu-gun, undated (WBSJ Tokushima Chapter database);

Kyushu ■ **Fukuoka Naka-sone** coast, Kitakyushu-shi, five, January 1992 (Environment Agency of Japan 1988–1997); Shinmoji, **Moji-ku**, Kitakyushu-shi, September–November 1995, four, September 1995, five, November 1995 (Y. Inoue *in litt.* 1998); **Imazu tidal flat**, Fukuoka-shi, four, September 1995 (*Birder* 95/12); ■ **Saga** unspecified locality, “Saga prefecture tidal land”, two, October 1987 (WBSJ 1987); ■ **Nagasaki** Moriyama-cho (untraced, mapped as Nagasaki prefecture), Kitatakaki-gun, one, November 1986 (WBSJ 1988); ■ **Miyazaki Hitotsuse-gawa river mouth**, Shintomi-cho, Koyu-gun, one, November 1995 (WBSJ 1997a); ■ **Kagoshima Izumi**, 1972 and 1989 (Y. Katoh *in litt.* 1999); Isa-gun (untraced), one, December 1985 (WBSJ 1986); unspecified locality, winter 1974 (Takano 1981);

Yaku-shima undated (OSJ 2000);

Okinawa island, one at Namizato, Kin-cho, November–December 1983 (McWhirter *et al.* 1996);

Miyako-jima island (not mapped), one on Ikema near Miyako-jima, December 1991 (McWhirter *et al.* 1996);

Minamidaito-son island, Shimajiri-gun, one, January 1997 (*Birder* 97/3);

Yonaguni-jima island, one, January 1997 (Environment Agency of Japan 1988–1997), two, February 1999 (*Birder* 99/5);

Iriomote-jima island, four, November 1989, three, October 1991 (McWhirter *et al.* 1996);

Yaeyama-jima **Taketomi-cho**, four, November 1989 (WBSJ 1990), four, January 1990 (Environment Agency of Japan 1988–1997).

■ **KOREA** ■ **NORTH KOREA** It is a regular passage migrant to North Korea, and there are reports of it wintering (see Tomek 1999); Won (1963) even mentioned reports that it might breed in the north-east of Korea, but this has never been proven. Records (by province) are as follows: ■ **North Hamgyong Manpo**, two collected, September 1929 (two specimens in YIO; also Austin 1948, Won 1963), October 1989 (J. Fiebig in Tomek 1999), April 1996 (N. Pertwee in Tomek 1999); ■ **Orang** (Orangchon), 27 seen, September 1989 (Fiebig 1993, Tomek 1999); ■ **North Pyongan Yongampo** (Ryongampho, Ringunpo), April 1929 (two specimens in YIO; also Austin 1948, Won 1963), winters (unspecified years) (Sonobe and Izawa 1987 in Tomek 1999); **Mumyongpyong**, October 1954 (Tomek 1999); **Sindo** (Schinto

island), Jalu river mouth (Amnok river mouth), suggested as a possible breeding locality (Kuroda 1918 in Meise 1934), April 1961 (Tomek 1999); **Chongchon-gang estuary**, 39 on the tidal flats, November 1989, at least 120 roosting, March 1990 (Fiebig 1993), c.2,000 estimated to occur on spring migration (unspecified years) (Pak U-il in Miyabayashi and Mundkur 1999), including on the Pakchon and Mundok plains, undated (Chong and Morishita 1996); ■ **South Pyongan Anju**, several collected, March 1932 (Won 1963); **Nampho**, Taedong-gang river mouth, two with Bean Geese *Anser fabalis*, April 1990 (Fiebig 1993, Tomek 1999); ■ **South Hwanghae** near **Kwail**, 15 seen, October 1980 (Fiebig 1993); unspecified localities in either North or South Hwanghae, collected, March (unspecified year), March 1949 (Austin 1948, Won 1963).

■ **SOUTH KOREA** The species is a passage migrant which winters in a few localities, with the most important concentrations on the Han estuary and Imjin river in Kyonggi province, and records (by province) as follows: ■ **Kyonggi and Seoul** lower **Imjin river** and **Han estuary**, three collected near the Han river, April 1913, where it was seen in March–April and October–November (Kuroda and Miyakoda 1919), up to 514 on the Han estuary, February–April 1993, maximum numbers in April (Won *et al.* 1993), probably wintering 1995–1996 when the maximum count was 770 in November, and c.70–100, December 1995 to January 1996 (Pae *et al.* 1995), maximum of 750 in 1998, at the Odusan observation platform (Lee Woo-shin *in litt.* 1998), and reportedly 2,500 on the lower Imjin river, February 1999 (MOE Korea 1999), but this needs to be verified (Kim Jin-han *in litt.* 2000); ■ **South Chungchong Seosan**, two, November 1993, one, February 1994 (Cho 1994); unspecified locality in either North or South Chungchong, April 1931 (male in YIO); ■ **South Kyongsang Chunam reservoir** (Junam), recorded in 1991 and 1992 (during a five-year survey, 1988–1992), maximum of three, February 1992 (Yu and Hahm 1994), 3–4 seen, 1998 (Lee Woo-shin *in litt.* 1998); **Tongpan reservoir**, up to three, 1992–1996 (Hahm 1997); **Nakdong estuary**, winter visitor (unspecified years) (Woo *et al.* 1997), one in 1995 (the only record during surveys, 1988–1996) at the west Nakdong river, c.4 km from the Nakdong estuary (Hahm and Kang 1997), 10 seen, October 1996 (did not winter) (Hur *et al.* 1999); ■ **North Cholla Kum river**, up to 30, 1998 (Lee Woo-shin *in litt.* 1998), 30 between Changhang and Ungpo, January 1999 (Sutherland and Son a Kim 1999), 43 on the lower Kum river, February 1999 (MOE Korea 1999); **Tongjin estuary**, Saemankeum area, 1–2 at irregular intervals (Park Jin-young *in litt.* 1999); ■ **South Cholla** unspecified locality, two collected, December 1926 (Austin 1948, Won 1963); ■ **Cheju Cheju island**, two seen, November 1988 (Lee Woo-shin *in litt.* 1998).

■ **CHINA** ■ **MAINLAND CHINA** The Swan Goose breeds in Heilongjiang, Inner Mongolia, and probably also in Jilin in north-east China, and it is widespread on passage and in winter in northern and eastern China. Almost the entire global population of this species winters in mainland China, from Beijing and Shandong south to the Yangtze basin, with the most important wintering grounds along the coast of Jiangsu, and at Poyang Hu, Dongting Hu and other lakes in the lower Yangtze valley. Records (by province) are as follows:

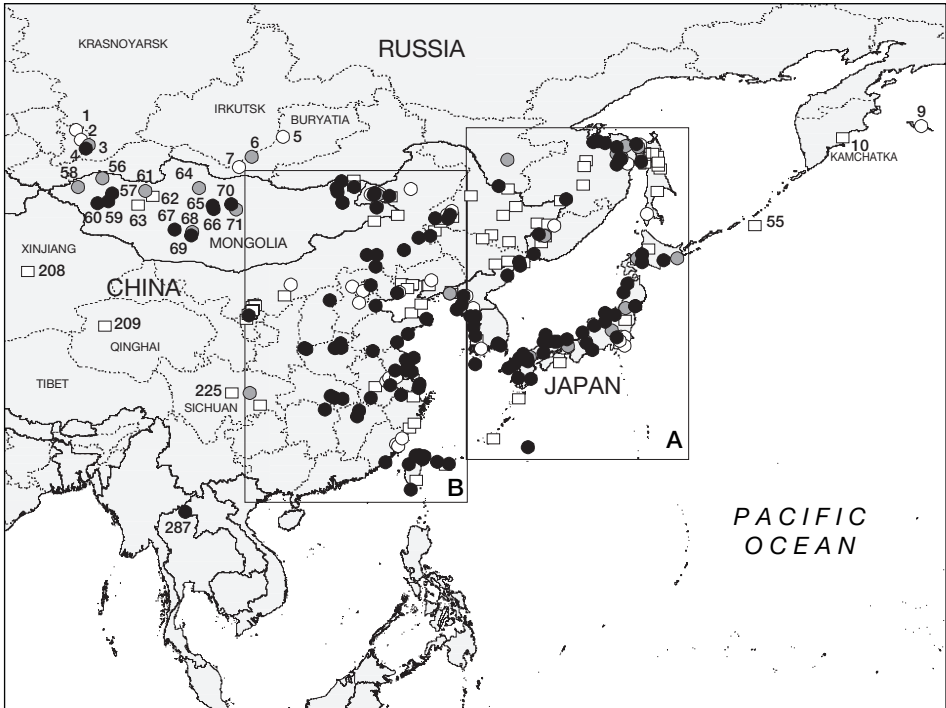
■ **Heilongjiang Wudalianchi city**, breeding recorded, undated (Wildlife Institute of Heilongjiang Province 1992); Sanjiang Nature Reserve, **Fuyuan county**, “common” summer visitor and passage migrant, undated (Liu Bowen *et al.* 1999); **Shuangfeng**, collected, undated (Wildlife Institute of Heilongjiang Province 1992); **Wuyur He** (Ujur) river, male collected at a breeding site, April 1927 (Meise 1934); **Dailing**, collected, undated (Wildlife Institute of Heilongjiang Province 1992); **Zhalong National Nature Reserve**, Qiqihar city, one collected at Qiqihar (Tzitzikar), May 1927 or 1929 (Meise 1934), mainly a passage migrant but a few staying to breed in the summer, undated (Gao Zhongxin 1990; also Scott 1989, Wildlife Institute of Heilongjiang Province 1992), six, June 1988 (P. Alström, U. Olsson and D. Zetterström *in litt.* 2000); **Yantongtun** (Jantuntun), 32 km south-east of Qiqihar (Tzitzikar), undated (Musilek in Meise 1934); **Taikang**, collected, undated (Wildlife Institute of Heilongjiang Province 1992); **Lianhuan Hu** Game Park, Dorbod Mongol autonomous county,

its numbers declining from 1985–1986 when it was regarded as “common” to 1991–1992 when it was regarded as “rare”, with only small flocks of 2–3 birds (Gao Jihong *et al.* 1995); **Zhuor river**, in this province and in Inner Mongolia, breeding, undated (Scott 1989); **Tailai county**, breeding recorded, undated (Wildlife Institute of Heilongjiang Province 1992); **Baoqing**, breeding recorded, undated (Wildlife Institute of Heilongjiang Province 1992); **Dongfanghong**, collected, undated (Wildlife Institute of Heilongjiang Province 1992); **Xingkai Hu National Nature Reserve** (Lake Khanka), collected, undated (Wildlife Institute of Heilongjiang Province 1992), 42 birds, March–April 1997 (Piao Renzhu and Li Wenfa 1998); **Shangzhi county**, collected, undated (Wildlife Institute of Heilongjiang Province 1992); **Wuchang county**, collected, undated (Wildlife Institute of Heilongjiang Province 1992); Sanjiang Plain, “abundant” in the Jiamusi and **Mudanjiang** districts, undated (Ma Yiqing *et al.* 1991);

■ **Jilin Baicheng prefecture**, not numerous, undated (Jilin Wildlife Conservation Society 1987); **Xianghai National Nature Reserve**, a few breeding, undated (Scott 1989), common summer breeding visitor, 1988–1989 (Gao Jihong *et al.* 1992a), flocks of several hundred being seen in late September (unspecified years) (Zhao Zhengjie 1988), 34 adults and four young, May 1994 (P. Alström, U. Olsson and D. Zetterström *in litt.* 2000); **Yanbian prefecture**, not numerous, undated (Jilin Wildlife Conservation Society 1987); **Jingxin tree farm**, Hunchun county, flocks of 50–100 birds, April 1983 (Zhao Zhengjie 1988); **Antu**, northern slope of the Changbai Shan mountains, undated (Zhao Zhengjie 1985);

■ **Liaoning** near **Niuzhuang** (Niutschwang), Liao river mouth, several collected, September 1889, when it was abundant (La Touche 1920–1921; also Meise 1934); **Jianchang**, common passage migrant, undated (Liaoning Ornithological Survey Team 1986); **Jinxi city**, common passage migrant, undated (Liaoning Ornithological Survey Team 1986); **Yingkou city**, common passage migrant, undated (Liaoning Ornithological Survey Team 1986); **Liao He** river, March (unspecified years) (Huang Mupeng *et al.* 1989); **Xingcheng city**, common passage migrant, undated (Liaoning Ornithological Survey Team 1986); **Suizhong county**, common passage migrant, undated (Liaoning Ornithological Survey Team 1986); **Dandong**, common passage migrant, undated (Liaoning Ornithological Survey Team 1986); **Yalu Jiang** river, March and August (unspecified years) (Huang Mupeng *et al.* 1989); **Dalian**, common passage migrant, undated (Liaoning Ornithological Survey Team 1986);

■ **Inner Mongolia** near **Yakeshi** (Yakchih, Jakschi), 95 km north-west of “Buchedu”, pairs “ready to breed” in mid-May in the 1930s (Loukashkin in Piechocki 1956); near **Lamagulusu**, 10 km south-west of Dalai Hu lake, April and May 1935 (Piechocki 1956, two specimens in YIO); **Barga**, 10 km south-east of Dalai Hu lake, male collected, August 1956, from a “huge” flock (Piechocki 1956); **Herlen He** (Kerulen river, Kerulan river), a few seen in 1928 (Tugarinow in Piechocki 1956); **Dalai Hu National Nature Reserve** (Hulun Nur), 80 birds, August 1990 (King and Jin Longrong 1992–1993), breeding, thousands of birds occurring annually in April–September (Wuliji and Liu Songtao *in litt.* 1998); **Medamuji**, 30 birds, July 1988, at least 300 birds at (nearby) Xia Mi, including several family parties, July 1991 (P. Alström, U. Olsson and D. Zetterström *in litt.* 2000), 100 birds, August 1990 (King and Jin Longrong 1992–1993); Hueihe river, **Huihe Nature Reserve**, 60 km south of Hailar, breeding, undated (Scott 1989); **Buir Nur** (Bouir-nor river), hundreds seen in 1928 (Tugarinow in Piechocki 1956); Tumeeji Sum, **Jalaid Qi**, passage migrant, usually in small numbers (not more than 40 birds), unspecified years, with two in June 1992 but no evidence of breeding (Liu Bowen *in litt.* 1998); **Horqin Nature Reserve**, passage migrant, several dozen in April 1988 and April 1994 (Arongqiige *in litt.* 1998); **Ar Horqin Qi**, Chifeng city, July 1987 (Fei Rongzhong *et al.* 1993); **Dalai Nur Nature Reserve** (Dalainor Nature Reserve), Chifeng city, breeding, more than 100 birds, August 1995 (Arongqiige *in litt.* 1998); **Hexigten Qi**, Chifeng city, July 1987 (Fei Rongzhong *et al.* 1993); c.250 km west-north-west of **Baotou** (Paotow), female collected, April 1922 (Riley 1930a); **Taolimiao-Alashan Nur**, passage migrant, with several hundred in April–May and September–October (He Fenqi *et al.* 1996);



■ *Xinjiang* unspecified localities, widespread in Xinjiang during migration, commonly seen in the Altay and Tien Shan mountains (Yuan Guoying 1991);

■ *Qinghai Qaidam Basin*, undated (Li Dehao 1989);

■ *Ningxia* (mainly along the Yellow River) Huidong farm, **Pingluo county**, undated (Wang Xiangting 1990); banks of the Yellow River (Huang He), **Taole county**, undated (Wang Xiangting 1990); **Qianjin Hu** lake, Pingluo county, undated (Wang Xiangting 1990); **Qianjin farm**, Pingluo county, undated (Wang Xiangting 1990); **Jingui**, Helan county, undated (Wang Xiangting 1990); **Tonggui**, Helan county, undated (Wang Xiangting 1990); **Zhangzhengqiao** (Zhangzheng), Yongning county, undated (Wang Xiangting 1990); **Tongqiao**, Yongning county, undated (Wang Xiangting 1990); **Yongning county**, at Donghe and Wangtai, undated (Wang Xiangting 1990); **Rencundu** (Rencun), Yongning county, undated (Wang Xiangting 1990); **Lingwu Farm**, Lingwu county, undated (Wang Xiangting 1990); **Xinhuaqiao**, Lingwu county, undated (Wang Xiangting 1990); **Qingtongxia city**, at Daiba reservoir and Lianhu farm, undated (Wang Xiangting 1990); **Qingtongxia reservoir** tree farm, Qingtongxia city, 2,000 birds with other geese at Xihe marsh, April 1986 (Wang Xiangting 1990); **Qukoupu** (Qukou) farm, Zhongning county, undated (Wang Xiangting 1990);

■ *Sichuan Jintang county*, undated (Li Guiyuan 1995);

suburbs of **Nanchong city**, 280 m, November 1958 (Li Guiyuan 1985, 1995, specimen in STCCN); **Changshou**, undated (Li Guiyuan 1995); Longzhong (untraced), undated (Li Guiyuan 1995);

■ *Shanxi Xiaruyue* reservoir, Fanshi county, October 1991 (Su Hualong and Liu Huanjin 1995);

■ *Hebei Saihanmiao Shan* (Saihanba), Weichang county, common summer visitor, March–August 1992–1995 (Hou Jianhua *et al.* 1997); **Huailai county**, April 1932 (specimen in ASCN);

The distribution of Swan Goose *Anser cygnoides* (map opposite): (1) Bele lake; (2) Irengol lake; (3) Chernoye lake; (4) Beyskiy district; (5) Baikal lake; (6) Selenga delta; (7) Khamar-Daban; (8) Torey lakes; (9) Commander islands; (10) Semylyachik lagoon; (11) Ul'bansky bay; (12) Ul'ban river mouth; (13) Usalgin river mouth; (14) Schast'ya bay; (15) Langr island; (16) Mago; (17) Puir; (18) Chertovo lake; (19) Bichi river; (20) Bichi river mouth; (21) Alochka river; (22) Udyl' lake; (23) Chukchagirskeye lake; (24) Pil'da river; (25) Kizi lake; (26) Kholan channel; (27) Evoron lake; (28) Bolon' lake; (29) Ul'ma river; (30) Poyarkovo; (31) Bureya river; (32) Osinovaya channel; (33) Iman river; (34) Verkhniy Sungach river mouth; (35) Sungacha lakes; (36) Lefu river mouth; (37) Suyfun river mouth; (38) Khasanskiy district; (39) Pil'tun river; (40) Val river; (41) Khoyambusibin river; (42) Askasai river; (43) Vagis river; (44) Pogibi river; (45) Bol'shaya Uangi river; (46) Lakh river; (47) Tym' river; (48) Tyk bay; (49) Tyk river; (50) Viakhtu river; (51) Nabil'skiy bay; (52) Lun'skiy bay; (53) Poronay river; (54) Mauka; (55) Kuril islands; (56) Uvs Nuur; (57) Ayrag Nuur; (58) Achit Nuur; (59) Chono Kharaiikh river; (60) Khar Us Nuur National Park; (61) Oigon Nuur; (62) Telmen-nur; (63) Dzavkhan; (64) Selenge river; (65) Ögiy Nuur; (66) Doityn Tsagaan Nuur; (67) Boon Tsagaan Nuur; (68) Davs Nuur; (69) Orog Nuur; (70) Tsagaan Nuur; (71) Öndörshireet; (72) Büse Nuur; (73) Mongol Daguur Strictly Protected Area; (74) Khökh Nuur; (75) Uldz river; (76) Khaichiin Tsagaan Nuur; (77) Bayan Tumen; (78) Choibalsan; (79) Bayan Nuur; (80) Numrug Strictly Protected Area; (81) Eastern Mongolia Strictly Protected Area; (82) Kamikawa; (83) Miyajima-ura; (84) Akkeshi lake; (85) Ishikari; (86) Sapporo; (87) Uraho-cho; (88) Lake Utonai; (89) Tsuruta-machi; (90) Izu-numa; (91) Hasama-cho; (92) Hachiro-gata; (93) Yamagata; (94) Fukushima; (95) Gunma; (96) Sayama-shi; (97) Higashikatsushika-gun; (98) Tega-numa; (99) Gyotoku; (100) Tokyo bay; (101) Wada-numa; (102) Arakawa; (103) Yokohama; (104) Kanai-machi; (105) Sado island; (106) Fukushima-gata; (107) Asahi-ike; (108) Kurobe-gawa river mouth; (109) Kaga-shi; (110) Ono-gun; (111) Hashima-shi; (112) Tahara-cho; (113) Kumihama bay; (114) Hyogo; (115) Koyama-ike; (116) Nakano-umi; (117) Kurayoshi-shi; (118) Nishinoshima-cho; (119) Inashi-gawa river mouth; (120) Hii-gawa river mouth; (121) Saijo-cho; (122) Yuya bay; (123) Shimonoseki-shi; (124) Nishiura; (125) Ajisu reclamation; (126) Shishikui-cho; (127) Naka-sonne; (128) Moji-ku; (129) Imazu tidal flat; (130) Saga; (131) Moriyama-cho; (132) Hitotsuse-gawa river mouth; (133) Izumi; (134) Yaku-shima; (135) Okinawa island; (136) Minamidaite-son; (137) Yonaguni-jima; (138) Iriomote-jima; (139) Taketomi-cho; (140) Manpo; (141) Orange; (142) Yongampo; (143) Mumyongpyong; (144) Sindo; (145) Chongchon-gang estuary; (146) Anju; (147) Nampho; (148) Kwail; (149) Hwanghae; (150) Imjin river; (151) Han estuary; (152) Seosan; (153) Chunam reservoir; (154) Tongpan reservoir; (155) Nakdong estuary; (156) Kum river; (157) Tongjin estuary; (158) South Cholla; (159) Cheju island; (160) Wudalianchi city; (161) Fuyuan county; (162) Shuangfeng; (163) Wuyur He; (164) Dailing; (165) Zhalong National Nature Reserve; (166) Yantongtun; (167) Taikang; (168) Lianhuan Hu; (169) Zhuor river; (170) Tailai county; (171) Baoqing; (172) Dongfanghong; (173) Xingkai Hu National Nature Reserve; (174) Shangzhi county; (175) Wuchang county; (176) Mudanjiang; (177) Baicheng prefecture; (178) Xianghai National Nature Reserve; (179) Yanbian prefecture; (180) Jingxin; (181) Antu; (182) Niuzhuang; (183) Jianchang; (184) Jinxi city; (185) Yingkou city; (186) Liao He; (187) Xingcheng city; (188) Suizhong county; (189) Dandong; (190) Yalu Jiang; (191) Dalian; (192) Yakeshi; (193) unallocated; (194) Lamagulusu; (195) Barga; (196) Herlen He; (197) Dalai Hu National Nature Reserve; (198) Medamuji; (199) Huihe Nature Reserve; (200) Buir Nur; (201) Jalaid Qi; (202) Horqin Nature Reserve; (203) Ar Horqin Qi; (204) Dalai Nur Nature Reserve; (205) Hexigten Qi; (206) Baotou; (207) Taolimiao-Alashan Nur; (208) Xinjiang; (209) Qaidam Basin; (210) Pingluo county; (211) Taole county; (212) Qianjin Hu; (213) Qianjin farm; (214) Jingui; (215) Tonggui; (216) Zhangzhengqiao; (217) Tongqiao; (218) Yongning county; (219) Rencundu; (220) Lingwu farm; (221) Xinhuaqiao; (222) Qingtongxia city; (223) Qingtongxia reservoir; (224) Qukoupu; (225) Jintang county; (226) Nanchong city; (227) Changshou; (228) Xiaruyue; (229) Saihanmiao Shan; (230) Huailai county; (231) Qinhuangdao; (232) Beidaihe; (233) Xin'an; (234) Beidagang; (235) Miyun reservoir; (236) Summer Palace; (237) Changshan islands; (238) Weihai city; (239) Qingdao; (240) Rizhao; (241) Weishan Hu; (242) Pangzhai; (243) Liuyuankou; (244) Heigangkou; (245) Madu; (246) Wantan; (247) Sanmenxia; (248) Sanmenxia Nature Reserve; (249) Chen Hu; (250) Hannan lakes; (251) Liangzi Hu; (252) Chao Hu; (253) Shijiu Hu; (254) Shengjin Hu; (255) Jianguo coast; (256) Sheyang salt works; (257) Yancheng Nature Reserve; (258) Dongtai; (259) Gaoyou Hu; (260) Liulishie; (261) Zhenjiang; (262) Pukou; (263) Tan-tse-kay; (264) Chongming Dao; (265) Shanghai; (266) Mogan Shan; (267) Haiyan; (268) Yueqing county; (269) Pingyang county; (270) Sansha bay; (271) Fuzhou; (272) Meihua; (273) Jinmen Dao; (274) Poyang Hu Nature Reserve; (275) Nanchang city; (276) Dong Dongting Hu Nature Reserve; (277) Kuantu; (278) Shetzuo; (279) Tayuan; (280) Kungliao; (281) Tienliaoang; (282) Tapingting; (283) Lanyang estuary; (284) Kaomei; (285) Tung-ho; (286) Lungluan Tan; (287) Chiang Saen.

○ Historical (pre-1950) ● Fairly recent (1950–1979) ● Recent (1980–present) □ Undated



Qinhuangdao (Chinwangtao), one collected, October 1912 (La Touche 1920–1921); **Beidaihe**, one, September 1945 (Hemmingsen and Guildal 1968), 51 flying northwards, March 1985 (Williams 1986), total of 24, March 1986 (P. Alström, U. Olsson and D. Zetterström *in litt.* 2000), one, October 1986 (Tao Yu *et al.* 1991); **Xin'an**, February and December 1935 (two specimens in ASCN);

■ **Tianjin Beidagang** reservoir, passage migrant, low numbers, November 1998 and March–April 1999 (Zhang Shuping *et al.* 1999);

■ **Beijing Miyun reservoir**, 75 birds, January 1991 (Waterbird Specialist Group 1994); **Summer Palace**, seen in May and October 1920, with large numbers being reported on the lake (Wilder and Hubbard 1924), and one goose probably of this species, April 1942 (Hemmingsen 1948, Hemmingsen and Guildal 1968);

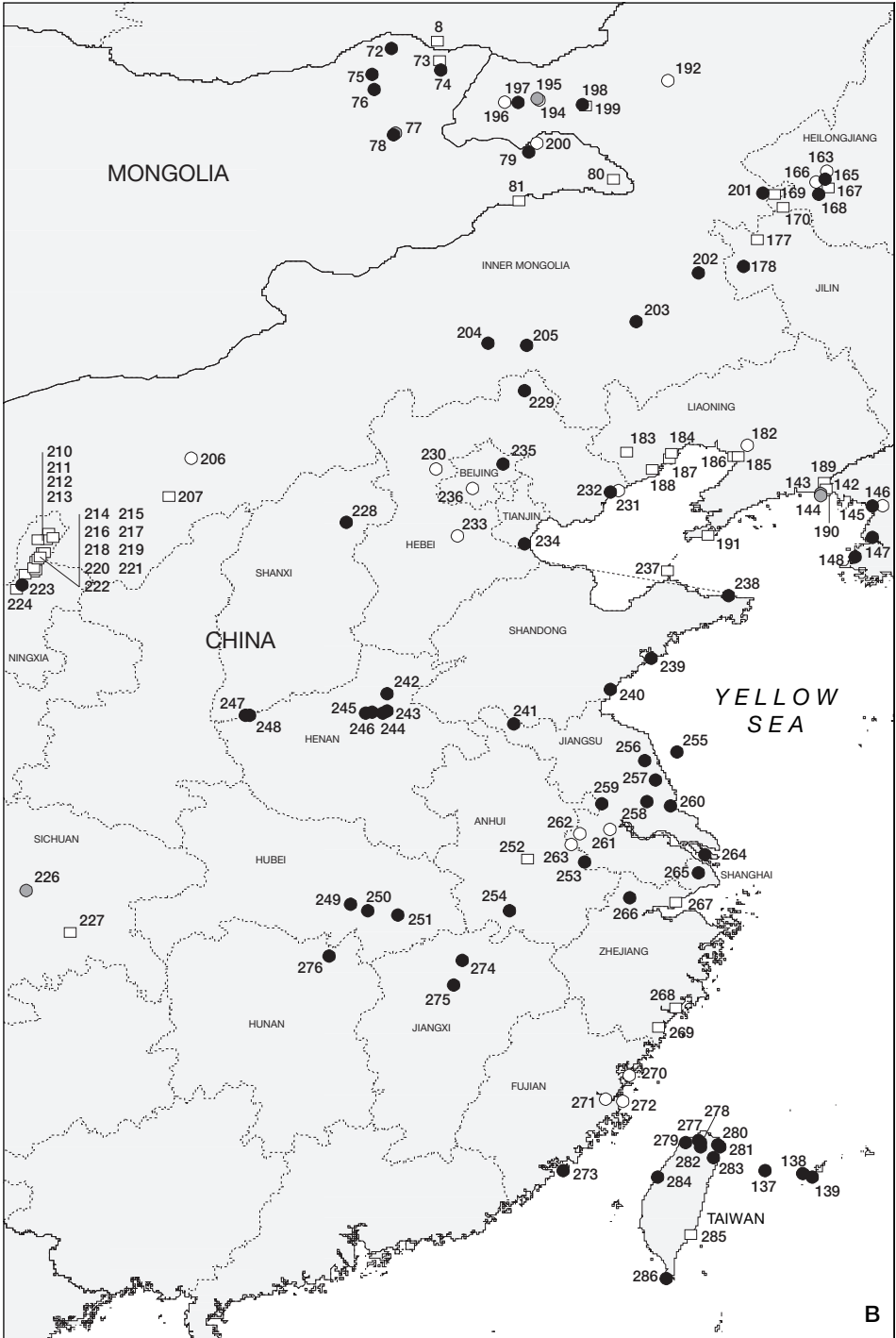
■ **Shandong Changshan islands**, Changdao county, October (unspecified years) (Fan Qiangdong and Xu Jianmin 1996); **Weihai city** wetlands, including Bahe Gang, Mishan, Longjiaoshan, Yuehu, Shidao, Wuleidao, Rushankou and Muzhuhe, rare passage migrant, 1995–1997 (Yan Liqin *et al.* 1998); **Qingdao** coastal wetlands, “common”, November–March (unspecified years) (Liu Daiji *et al.* 1994), 30 birds, January 1990, 600 birds, January 1992 (Waterbird Specialist Group 1994); **Rizhao** coast, 120 birds, December 1991 (Waterbird Specialist Group 1994); Nansi Hu lake (including **Weishan Hu**, Nanyang Hu, Dushan Hu and Zhaoyang Hu), common in winter (unspecified years) (Scott 1989), “rare”, 1988–1991 (Feng Zhilu *et al.* 1996);

■ **Henan Pangzhai** (the old channel of the Yellow River in northern Henan), 23 birds, January 1990, 412 birds, November 1991 (Waterbird Specialist Group 1994); Yellow River, including **Liuyuankou**, **Heigangkou**, **Madu**, **Wantan**, and **Sanmenxia**, total of 2,146 birds, early 1990s (Wang Wenlin *et al.* 1998), at Heigangkou, 136 birds in January 1991, 255 birds in January 1993 (Waterbird Specialist Group 1994), and 1,500 birds reported, undated (Miyabayashi and Mundkur 1999); **Sanmenxia Nature Reserve**, March 1995 (Wang Wenlin *et al.* 1999);

■ **Hubei Chen Hu** lake, 50 birds, December 1998 (Hu Hongxing 1999);

The distribution of Swan Goose *Anser cygnoides* (map A opposite): (11) Ul'bansky bay; (12) Ul'ban river mouth; (13) Usalgin river mouth; (14) Schast'ya bay; (15) Langr island; (16) Mago; (17) Puir; (18) Chertovo lake; (19) Bichi river; (20) Bichi river mouth; (21) Alochka river; (22) Udyll' lake; (23) Chukchagirs koye lake; (24) Pil'da river; (25) Kizi lake; (26) Kholan channel; (27) Evoron lake; (28) Bolon' lake; (29) Ul'ma river; (30) Poyarkovo; (31) Bureya river; (32) Osinovaya channel; (33) Iman river; (34) Verkhniy Sungach river mouth; (35) Sungacha lakes; (36) Lefu river mouth; (37) Suyfun river mouth; (38) Khasanskiy district; (39) Pil'tun river; (40) Val river; (41) Khoyambusibin river; (42) Askasai river; (43) Vagis river; (44) Pogibi river; (45) Bol'shaya Uangi river; (46) Lakh river; (47) Tym' river; (48) Tyk bay; (49) Tyk river; (50) Viakhtu river; (51) Nabil'skiy bay; (52) Lun'skiy bay; (53) Poronay river; (54) Mauka; (82) Kamikawa; (83) Miyajima-ura; (84) Akkeshi lake; (85) Ishikari; (86) Sapporo; (87) Urahoro-cho; (88) Lake Utonai; (89) Tsuruta-machi; (90) Izu-numa; (91) Hasama-cho; (92) Hachiro-gata; (93) Yamagata; (94) Fukushima; (95) Gunma; (96) Sayama-shi; (97) Higashikatsushika-gun; (98) Tega-numa; (99) Gyotoku; (100) Tokyo bay; (101) Wada-numa; (102) Arakawa; (103) Yokohama; (104) Kanai-machi; (105) Sado island; (106) Fukushima-gata; (107) Asahi-ike; (108) Kurobe-gawa river mouth; (109) Kaga-shi; (110) Ono-gun; (111) Hashima-shi; (112) Tahara-cho; (113) Kumihama bay; (114) Hyogo; (115) Koyama-ike; (116) Nakano-umi; (117) Kurayoshi-shi; (118) Nishinoshima-cho; (119) Inashi-gawa river mouth; (120) Hii-gawa river mouth; (121) Saijo-cho; (122) Yuya bay; (123) Shimonoseki-shi; (124) Nishiura; (125) Ajisu reclamation; (126) Shishikui-cho; (127) Naka-sone; (128) Moji-ku; (129) Imazu tidal flat; (130) Saga; (131) Moriyama-cho; (132) Hitotsuse-gawa river mouth; (133) Izumi; (134) Yaku-shima; (135) Okinawa island; (136) Minamidaito-son; (140) Manpo; (141) Orang; (145) Chongchon-gang estuary; (146) Anju; (147) Nampho; (148) Kwail; (149) Hwanghae; (150) Imjin river; (151) Han estuary; (152) Seosan; (153) Chunam reservoir; (154) Tongpan reservoir; (155) Nakdong estuary; (156) Kum river; (157) Tongjin estuary; (158) South Cholla; (159) Cheju island; (160) Wudalianchi city; (161) Fuyuan county; (162) Shuangfeng; (164) Dailing; (171) Baoqing; (172) Dongfanghong; (173) Xingkai Hu National Nature Reserve; (174) Shangzhi county; (175) Wuchang county; (176) Mudanjiang; (179) Yanbian prefecture; (180) Jingxin; (181) Antu.

○ Historical (pre-1950) ● Fairly recent (1950–1979) ● Recent (1980–present) □ Undated



Hannan lakes, 120 birds, January 1990 (Waterbird Specialist Group 1994); **Liangzi Hu lake**, Hannan lakes, 500 birds, January 1999 (Hu Hongxing 1999);

■ **Anhui Chao Hu** (Cao Hu), 20 km south-east of Hefei, winter visitor (unspecified years) (Scott 1989); **Shijiu Hu lake**, 65 birds, February 1992, 85 birds, December 1993 (Waterbird Specialist Group 1994); **Shengjin Hu lake**, 40 birds, January 1988 (Scott 1989), 42 birds, January 1990 (Waterbird Specialist Group 1994), 1,170 birds, winter 1993–1994 (Miyabayashi and Mundkur 1999);

■ **Jiangsu Jiangsu coast**, including Yancheng Nature Reserve, 9,100 birds, January 1991 (Waterbird Specialist Group 1994); **Sheyang salt works**, Yancheng Nature Reserve, 300 birds, winter 1989–1990 (Wang Hui and Du Jinjin 1993), 505 birds, January 1990, 90 birds, January 1991 (Waterbird Specialist Group 1994); **Yancheng Nature Reserve**, 35,000 birds at 23 localities throughout the region, January 1988 (Scott 1989), with 1,878 birds in the core area of the reserve, January 1991, 895 birds in the core area, winter 1991–1992 (Waterbird Specialist Group 1994), 492 birds, December 1997 to January 1998 (Su Hualong *et al.* 1998); **Dongtai Dunmenkou**, in or near to Yancheng Nature Reserve, 1,144 birds, November 1991 (Waterbird Specialist Group 1994); **Gaoyou Hu** and **Gaobao Hu lakes**, 1,100 birds, January 1990 (Waterbird Specialist Group 1994); **Dongtai Liulishu**, Yancheng Nature Reserve, 1,198 birds, November 1991 (Waterbird Specialist Group 1994); **Zhenjiang** (Chinkiang), one collected, c.1910 (La Touche 1913), small flocks flying south over the Zhenjiang mountains between Nanjing (Nanking) and Zhenjiang, late October 1921 (Kolthoff 1932); **Pukou** (Pookow), a few heard amongst flocks of Bean Geese, February 1922 (Kolthoff 1932); “**Tan-tse-kay**”, near the Anhui border, a few heard amongst flocks of Bean Geese, February 1922 (Kolthoff 1932);

■ **Shanghai east coast of Chongming Dao island**, 50 birds, January 1990, 200 birds, January 1991 (Waterbird Specialist Group 1994); **Shanghai**, November 1868, March 1869 and December 1887 (four specimens in BMNH), 15 wild birds at Xijiao Zoo, January 1991 (Waterbird Specialist Group 1994);

The distribution of Swan Goose *Anser cygnoides* (map B opposite): (8) Torey lakes; (72) Büse Nuur; (73) Mongol Daguur Strictly Protected Area; (74) Khökh Nuur; (75) Uldz river; (76) Khaichiin Tsagaan Nuur; (77) Bayan Tumen; (78) Choibalsan; (79) Bayan Nuur; (80) Numrug Strictly Protected Area; (81) Eastern Mongolia Strictly Protected Area; (137) Yonaguni-jima; (138) Iriomote-jima; (139) Taketomi-cho; (142) Yongampo; (143) Mummyongpyong; (144) Sindo; (145) Chongchon-gang estuary; (146) Anju; (147) Nampho; (148) Kwail; (163) Wuyur He; (165) Zhalong National Nature Reserve; (166) Yantongtun; (167) Taikang; (168) Lianhuan Hu; (169) Zhuor river; (170) Tailai county; (177) Baicheng prefecture; (178) Xianghai National Nature Reserve; (182) Niuzhuang; (183) Jianchang; (184) Jinxi city; (185) Yingkou city; (186) Liao He; (187) Xingcheng city; (188) Suizhong county; (189) Dandong; (190) Yalu Jiang; (191) Dalian; (192) Yakeshi; (193) unallocated; (194) Lamagulusu; (195) Barga; (196) Herlen He; (197) Dalai Hu National Nature Reserve; (198) Medamuji; (199) Huihe Nature Reserve; (200) Buir Nur; (201) Jalaid Qi; (202) Horqin Nature Reserve; (203) Ar Horqin Qi; (204) Dalai Nur Nature Reserve; (205) Hexigten Qi; (206) Baotou; (207) Taolimiao-Alashan Nur; (210) Pingluo county; (211) Taole county; (212) Qianjin Hu; (213) Qianjin farm; (214) Jingui; (215) Tonggui; (216) Zhangzhengqiao; (217) Tongqiao; (218) Yongning county; (219) Rencundu; (220) Lingwu farm; (221) Xinhuaqiao; (222) Qingtongxia city; (223) Qingtongxia reservoir; (224) Qukoupu; (226) Nanchong city; (227) Changshou; (228) Xiaruyue; (229) Saihanmiao Shan; (230) Huailai county; (231) Qinhuangdao; (232) Beidaihe; (233) Xin'an; (234) Beidagang; (235) Miyun reservoir; (236) Summer Palace; (237) Changshan islands; (238) Weihai city; (239) Qingdao; (240) Rizhao; (241) Weishan Hu; (242) Pangzhai; (243) Liuyankou; (244) Heigangkou; (245) Madu; (246) Wantan; (247) Sanmenxia; (248) Sanmenxia Nature Reserve; (249) Chen Hu; (250) Hannan lakes; (251) Liangzi Hu; (252) Chao Hu; (253) Shijiu Hu; (254) Shengjin Hu; (255) Jiangsu coast; (256) Sheyang Salt Works; (257) Yancheng Nature Reserve; (258) Dongtai; (259) Gaoyou Hu; (260) Liulishu; (261) Zhenjiang; (262) Pukou; (263) Tan-tse-kay; (264) Chongming Dao; (265) Shanghai; (266) Mogan Shan; (267) Haiyan; (268) Yueqing county; (269) Pingyang county; (270) Sansha bay; (271) Fuzhou; (272) Meihua; (273) Jinmen Dao; (274) Poyang Hu Nature Reserve; (275) Nanchang city; (276) Dong Dongting Hu Nature Reserve; (277) Kuantu; (278) Shetzuo; (279) Tayuan; (280) Kungliao; (281) Tienliaoyang; (282) Tapingting; (283) Lanyang estuary; (284) Kaomei; (285) Tung-ho; (286) Lungluan Tan.

○ Historical (pre-1950) ● Fairly recent (1950–1979) ● Recent (1980–present) □ Undated

■ **Zhejiang Mogan Shan** mountains, Deqing county, December 1993 (Zhu Xi and Fan Houde 1995); **Haiyan**, undated (Zhuge Yang 1990); **Yueqing county**, undated (Zhuge Yang 1990); **Pingyang county**, collected, undated (Zhuge Yang 1990);

■ **Fujian** (note that Jinmen Dao island is under the administration of Taipei) **Sansha bay** (Samsha bay), north of Fuzhou, November 1898 (Rickett 1900a, two specimens in BMNH); **Fuzhou** (Foochow), one bird probably this species reported by a local hunter, c.1890, but apparently rare in the region (La Touche 1892), December 1913 (male in BMNH); **Meihua**, Min Jiang river mouth, Fuzhou, October 1913 (specimen in BMNH); Pujian, **Jinmen Dao** (Chin-men Tao, Kinmen or Quemoy) island, one in 1998 (CWBF database);

■ **Jiangxi Poyang Hu Nature Reserve**, February 1960 (three specimens in ASCN), abundant in the nature reserve, but restricted to specific locations, e.g. Dahu Chi and Bang Hu held totals of over 40,000 and 10,000 birds respectively and Sha Hu held over 1,000 birds in January 1986, with small groups and family parties noted elsewhere (usually flying towards one of the major concentrations) (Kennerley 1987), 6,411 birds, January 1990, 9,200 birds, January 1991, 6,617 birds, November 1991 (Waterbird Specialist Group 1994), maximum count of 6,740 birds in winter 1998–1999 (Zhao Jinsheng and Wu Jiandong 1999); Linchong Hu lake, **Nanchang city**, c.500 birds, January 1999, probably moving to feed because floods had killed most waterplants at Poyang Hu (Liu Zhiyong *et al.* 1999);

■ **Human Dong Dongting Hu Nature Reserve**, 250 birds, January 1990, 4,800 birds, February 1991, 288 birds, December 1991 (Waterbird Specialist Group 1994), maximum of 20,000 birds in 1994 (Lei Gang *in litt.* 1997), c.3,100–5,600 birds wintering in 1992–1996 (Lei Gang and Qian Weirong 1998), 5,600 birds at Daxi Hu, Xiaoxi Hu and Chaishang Hu lakes, winter 1995–1996 (Miyabayashi and Mundkur 1999), 990 birds at Xiaoxi Hu, February 1997 (Iwabuchi *et al.* 1997).

■ **TAIWAN** It is a rare winter visitor, with records as follows (for records on Jinmen Dao island see under Fujian province above): **Kuantu** and **Shetzu**, Taipei, one, December 1995 to February 1996 (Fang Woei-horng 1996), three, January 1997 (Fang Woei-horng 1998), three in 1996 (CWBF database); **Tayuan**, Taoyuan county, one in 1997 (CWBF database); **Kungliao**, Taipei, one, December 1995 to February 1996, four, December 1996 (CWBF database); **Tienliaoyang**, Taipei, one in 1995, four in 1996 (CWBF database); **Tapingting**, Taoyuan county, one in 1997 (CWBF database); **Lanyang estuary**, Ilan county, some records of birds shot by hunters before 1985 (CWBF database), one in 1995 (CWBF database), two, January–February 2000 (*Oriental Bird Club Bull.* 32 [2000]: 66–76); **Kaomei** (Tachia estuary), Taichung, seven, January–February 1995 (CWBF database); **Tung-ho**, Taitung county, undated (CWBF database); **Lungluan Tan**, Pingtung county, one in 1995 (CWBF database).

■ **THAILAND** There is a single record: **Chiang Saen**, Chiang Rai province, single bird on the Mekong river, January 1996 (*Bird Conserv. Soc. Thailand Bull.* 13, 2 [1996]: 14, A. Liukiratiyutkul *per* P. D. Round *in litt.* 2001).

POPULATION The Swan Goose was regarded as a common bird in several parts of its breeding range in eastern Russia and Mongolia in the nineteenth and early twentieth centuries, but it has clearly declined substantially (see below) and continues rapidly to do so. Rose and Scott (1997) estimated its population at 50,000 birds and declining, and the most recent global population estimate is of 30,000–50,000 birds (Miyabayashi and Mundkur 1999). However, the latter estimate may be over-optimistic given the reports of rapid declines in waterfowl numbers on one of its main wintering grounds in China (see below).

Russia It was considered to be a common breeding and passage bird in eastern Russia at the start of twentieth century, and in some places even abundant, but it has now declined substantially. On the Torey lakes in Chita, several tens of pairs nested in the 1980s (Flint 1984), and there were up to 50 breeding pairs and c.900 moulting birds in the early 1990s, but

their numbers have since declined following a series of dry years (E. E. Tkachenko *in litt.* 1997). In Khabarovsk, the species was formerly common at several localities (see Distribution), but it has recently declined, e.g. in the Kizi lake basin it used to be a common breeding species (Vorob'ev 1954) but now seems to have disappeared (B. A. Voronov *in litt.* 1997). By the 1980s it was considered that there were unlikely to be more than c.150–200 breeding pairs in Khabarovsk (Roslyakov 1981, 1987b). It was reported to be a common breeding species on the lower Amur river, and present in spring and summer on the middle reaches of the Amur, but it appeared to be absent from the upper Amur (Stegmann 1930). In Primorye, it was the commonest breeding waterfowl species in the swamps at Lake Khanka in the 1860s, and it was described as “very abundant” there on migration (Przheval'skiy 1877–1878). However, it had become a rare bird in this area by the 1920s (Shul'pin 1936) and it was considered to be an uncommon breeding species in the 1960s (Polivanova 1971). All recent records there refer to single birds or small groups, mainly on passage (Spangenberg 1965, Polivanova 1971, Shibaev 1974, Gorchakov 1996), and the only recent confirmed breeding record appears to be of a pair with chicks seen in 1976 (Glushchenko 1981). On Sakhalin island, the Swan Goose was locally common earlier this century; for example, 1,200–1,300 pairs were counted along 35 km of shoreline between the Tyk and Lakh capes in summer 1951 (Gizenko 1955). The breeding population has since steadily declined to a much lower level (Blokhin 1998a), and in the middle reaches of the Tyk river there were no more than 50 breeding pairs in 1984–1986 (Nechaev 1991). The total breeding population on Sakhalin hardly exceeded 100 pairs by the early 1990s (Nechaev 1991, 1992), and on spring migration its numbers have decreased at least tenfold since the 1940s and 1950s (Gizenko 1955, Nechaev 1991).

Mongolia This species used to be a very common breeding bird in Mongolia (Kozlova 1932–1933), and it was considered to be the commonest gamebird in western Mongolia (Bold 1965). It was thought to breed on nearly every large lake and along almost all of the rivers of northern Mongolia (Piechocki 1968). It is not possible to make a reliable current population estimate for Mongolia because of limited ornithological research there (A. Bräunlich *in litt.* 2000), but it is thought that its numbers have decreased to a few thousand birds because of hunting (D. Batdelger *in litt.* 1998).

Japan This species was widespread and relatively numerous in Japan until the 1920s, but it is now is a rare passage and winter visitor (N. Yanagisawa *in litt.* 1998). Kuroda (1939) noted that its wintering population declined significantly in the 1930s: in December 1922 there were 40 birds wintering in Saitama prefecture, but only three there in January 1933, and from 1927 to 1929 there were c.100 birds at Shinhama in Chiba prefecture, but only c.50 in 1930. About 200 birds wintered in Chiba prefecture in the 1920s and 1930s, but it is now become a very rare winter visitor (Takano 1981).

Korea Austin (1948) regarded this species as a common migrant in Korea, more plentiful in spring than in autumn. On spring and autumn passage, more than 1,000 individuals still occur at the Han river estuary in South Korea, and smaller numbers elsewhere (Lee Woo-shin *in litt.* 1998), and peak numbers of c.1,400 birds occur on southward migration (usually in November) and c.1,800 on northward migration (usually in March) (Park Jin-young *in litt.* 1999). Prior to the 1960s, flocks of 30–50 birds wintered in Korea (Won 1963), but the total wintering population in South Korea is usually under 100 birds (Lee Woo-shin *in litt.* 1998, Park Jin-young *in litt.* 1999).

Mainland China La Touche (1925–1934) considered this species to be “one of the least common of the wild geese of China”, presumably because at that time the very large wintering concentrations in the Yangtze basin had not been discovered, although he had found it abundant at the mouth of the Liao river in Liaoning, and Père David had described it as “coming in numerous flocks to pass the winter in the Celestial Empire”. Recent estimates of the wintering population in China are 30,000–50,000 birds (Lu Jianjian 1993b) and 10,000–100,000 birds (Waterbird Specialist Group 1994). The maximum count in the early 1990s

was 25,494 birds at nine sites in 1991, mostly at Poyang Hu lake in Jiangxi (9,200 birds), the Jiangsu coast (9,100) and at Dongting Hu lake in Hunan (4,800) (Waterbird Specialist Group 1994). However, Lu Jianjian (1993a,b) found that this was one of the most heavily hunted species in the Yangtze basin, at high enough levels to be causing a rapid population decline, and Hu Hongxing (1999) noted that the numbers of wintering birds in the lakes of Hubei province had “reduced remarkably”. Liu Zhiyong and Zhao Jinsheng (1998) noted that the numbers of waterfowl at Poyang Hu lake have declined greatly in the last 10 years, presumably mainly because of this intense hunting pressure, as wild ducks and geese were found in huge flocks in the mid-1980s but they are now sometimes “even rarer than cranes”.

ECOLOGY Habitat The Swan Goose breeds in marshes and near rivers and lakes in the steppe and forest-steppe zones (Madge and Burn 1988). In eastern Russia, it breeds in both upland and lowland landscapes: in the mountains, it inhabits lakes and tall grass along rivers, and in the lowlands of the lake Udyl' basin it nests in the smaller valleys in the lake catchment, and the broods move from these valleys to tussock grasslands along the lake shores (Poyarkov and Babenko 1987). On Sakhalin, it nests on dry ridges with bushes of shrub pine *Pinus pumila*, alder *Alnus maximowiczii*, dwarf birch *Betula middendorffii*, heath *Myrica tomentosa* and labrador tea *Ledum palustre* with sparse larches and a carpet of lichen-crowberry *Empetrum sibiricum* (Nechaev 1991). On the shores of Ul'bansky bay, moulting flocks have been found in larch swamps (“mari”) and on tidal flats (Voronov and Pronkevich 1991a). In Mongolia it nests in areas with dense grass and bushes, often on islands in salt- and freshwater lakes or along remote rivers with reeds and poplars (D. Batdelger *in litt.* 1998). In north-east China it occurs in marshes and by lakes and it is sometimes found in grasslands near saline lakes (Wildlife Institute of Heilongjiang Province 1992). In Ningxia, it is usually found in the plains near rivers, lakes and marshes, particularly in areas with dense waterplants (Wang Xiangting 1990). In winter it frequents lowland lakeside marshes and wet cultivation, such as ricefields (Madge and Burn 1988). Its habitats in Japan include freshwater lakes and marshes, tidal flats and harvested paddies (Takano 1981, N. Yanagisawa *in litt.* 1998). In South Korea it has been recorded on rivers, estuaries, lakes, reservoirs and canals, small ponds and on marshes with cattail and reedbeds (Yoo and Lee 1998).

Food On the breeding grounds the main food is sedges *Carex* (Vorob'ev 1954, Gizenko 1955), and in northern Sakhalin the main species consumed was *Carex subspatacea* (Nechaev 1991). In autumn, its diet includes a variety of berries, such as blueberry *Vaccinium uliginosum* and crowberry *Empetrum*, and it sometimes eats larch needles and berries (Gizenko and Mishin 1952 in Nechaev 1991). In Ningxia in northern China it roosted in marshes or on sandbanks along the rivers in the daytime, and fed in the rice paddies and grasslands at night (Wang Xiangting 1990). It usually feeds after dark, on plants and algae and also some molluscs (Cheng Tso-hsin 1979). The stomach of a bird collected in Zhejiang in February contained only plant material, including algae (Zhuge Yang 1990). During a study of the bioenergetics of this species in the main wintering areas along the eastern Chinese coast and in the Yangtze basin, a high proportion of its diet (at both lakes and coastal areas) was found to comprise of the roots of a waterplant, *Vallisneria asiatica*, and the seeds of a halophyte, *Suaeda salsa*; this diet was similar to that of many other waterbirds in these areas, especially the wintering Siberian Cranes *Grus leucogeranus* at Poyang Hu lake (Lu Jianjian 1993b).

Breeding Nesting begins in early to mid-May on the lower Amur (Shibaev 1989b), in early May on Sakhalin (Gizenko 1955), but from mid-April in Heilongjiang in China (Zhao Zhengjie 1988, Wildlife Institute of Heilongjiang Province 1992). The nests are sited on islands in rivers (Kuroda 1939), in thick grasses and reeds in marshland (Zhao Zhengjie 1988), in the remoter, drier parts of reedbeds, on grassy hills and on islands in reservoirs (Wildlife Institute of Heilongjiang Province 1992). In Mongolia it typically nests in colonies (Nowak 1970). Clutches consist of 5–6 eggs (sometimes up to eight) on the lower Amu (Shibaev 1989b), 3–

5 eggs on Sakhalin (Gizenko 1955) and 4–9 eggs in Heilongjiang (Wildlife Institute of Heilongjiang Province 1992). However, two or three females sometimes lay eggs in the same nest (Kuroda 1939), which may account for some of the large clutches that have been reported. In the lower Amur and on Sakhalin the eggs hatch by mid-June (Shibaev 1989b, Nechaev 1991), but in Heilongjiang the goslings have already reached adult size by mid-June (Wildlife Institute of Heilongjiang Province 1992). The broods tend to aggregate together into flocks, and float downstream to broader valleys or larger lakes in Amur or to the coastal plains on Sakhalin; the juveniles start to fly in early September (Gizenko 1955, Poyarkov 1984). Non-breeding birds tend to form separate flocks, staying close to shallow lakes in the coastal lowlands (Voronov and Pronkevich 1991a). On Sakhalin, such flocks numbered up to 200 individuals in the 1950s (Gizenko 1955).

Migration The Swan Goose arrives in the lower Amur area by early April, well before other goose species, and spring migration on Sakhalin occurs in the last 10 days of April through to early May; in autumn it occurs in September–October (Nechaev 1991). In Mongolia, the species arrives from the middle to the end of April, starts to nest in May, moults in August, rarely as early as July, and departs at the beginning of September (Nowak 1970). It arrives on the breeding grounds in China in mid- to late March and departs in mid-October (Zhao Zhengjie 1988). Prior to the 1960s, it was observed to follow two migratory routes along the eastern and western coast of the Korean Peninsula to its wintering grounds in south-east Korea and China (Won 1963). A bird that wintered at Izunuma in Miyagi prefecture on Honshu in 1980–1981 moved with a large flock of White-fronted Geese on 13 March 1981 to Hachiro-gata in Akita prefecture, and on 8 April it was found with White-fronted Geese at Seika-ko lake on Hokkaido, where it stayed until 5 May (Kurechi *et al.* 1982). The former wintering population in Japan used to stay longer on the wintering grounds than other geese, usually arriving in October, but sometimes in late September, with small numbers remaining into early May (Kuroda 1939). Wintering birds arrive in Zhejiang in south-east China in late November and remain until March or April (Zhuge Yang 1990).

THREATS *Habitat loss* *Russia* Some of the habitat of this species on Sakhalin island has been changed as a result of fires, and lost because of exploitation of the oil and gas reserves in the north of the island (V. A. Nechaev *in litt.* 1997). Its nesting habitats in the Lake Khanka lowlands have been degraded following drainage and ploughing for agricultural developments (Polivanova 1971, Shibaev 1989b). *Mongolia* Habitat degradation is thought to have reduced the breeding population (D. Batdelger *in litt.* 1998), e.g. grazing activity may be causing habitat degradation at Ögyi Nuur (Buckton *et al.* 1998). *Korea* Many of the wetlands where this species occurs on passage are under threat (see equivalent section under Baikal Teal *Anas formosa*). *Mainland China* This species is being affected by the drainage and degradation of its wetland habitats (see, e.g., Scott 1989, MacKinnon *et al.* 1996). For example, Sanjiang Plain in Heilongjiang was a very important breeding ground for waterfowl before the 1960s, when Swan Goose was a very common breeding bird there, but since the 1960s large areas have been reclaimed for farmland and there are now no large areas of uninhabited land on the plain (Ma Yiqing *et al.* 1991). This loss of habitat, together with the increased incidence of fire and other pressures caused by an expanding human population, has caused the number of breeding waterfowl to decline significantly, probably by more than 90%, and by the 1980s large flocks of geese and ducks only occurred there on passage (Ma Yiqing *et al.* 1991). The major wintering populations at Poyang Hu, Dong Dongting Hu and other lakes in the Yangtze valley are threatened by the construction of the Three Gorges Dam, which will change the seasonal flow of water in the Yangtze River and could significantly affect the wetlands downstream of the dam (Iwabuchi *et al.* 1998). Wang Wenlin *et al.* (1998) considered that the reclamation of wetlands was also a threat to waterfowl in Henan.

Hunting This species is particularly vulnerable to hunting because it is less shy than other geese. Przheval'skiy (1877–1878) described it as very inquisitive, and reported that single birds or pairs would usually come within range when they saw a dog or a sportsman. They will allow hunters to approach to 60–70 m, and are thus easily killed, especially if motorboats are used (Poyarkov 1984). *Russia* In the lower Amur drainage, one of the main threats is uncontrolled hunting pressure on its migratory flyways (B. A. Voronov *in litt.* 1997), and illegal shooting and trapping of birds on migration and in winter is a problem on Sakhalin, where goslings are also caught by local people (V. A. Nechaev *in litt.* 1997). *Mongolia* Poaching is also thought to have reduced its population in Mongolia (D. Batdelger *in litt.* 1998). At Boon Tsagaan Nur, Bayankhongor, in summer 1998 a local warden reported that a group of hunters from the USA had visited the lake and shot indiscriminately at birds, including geese and other waterbirds (M. van Beirs *in litt.* 1999). *Mainland China* On the Sanjiang plain, the increase in the human population has led to a major increase in the level of egg collection, which is considered to have resulted in annual declines of 30% or more in the waterfowl population there (Ma Yiqing *et al.* 1991). Wang Wenlin *et al.* (1998) reported that ducks and geese are hunted with punt guns and poisoned baits in Henan and Shandong provinces. A study of hunting pressure in the middle and lower basins of the Yangtze River in 1987–1992 estimated that c.50% of the total wintering waterfowl in this region were killed each year by local hunters, using netting, shooting and poisoning; the Swan Goose was one of the main quarry species, and it made up an average of 3.7% of the annual hunting “bag” (Lu Jianjian 1993a). During an investigation by a Chinese television company (*Jiao Dian Fang Tan*) in November 1999, hundreds of “White-fronted” and Swan Geese were seen openly offered for sale in Yugan and Poyang counties in Jiangxi; at nearby Poyang Hu lake, two groups of poachers were reported to have been arrested by the Public Security Bureau (possibly in response to the presence of the TV crew) (J. Hornskov *in litt.* 1999). Liu Zhiyong and Zhao Jinsheng (1998) noted that the numbers of waterfowl at Poyang Hu have declined greatly in the last 10 years, presumably mainly because of this intense hunting pressure.

Disturbance Increasing disturbance on the nesting and moulting grounds is considered to be a threat in the lower Amur drainage (B. A. Voronov *in litt.* 1997) and on Sakhalin (V. A. Nechaev *in litt.* 1997). At Ögiy Nuur in Mongolia, the level of fishing activity did not appear to cause significant disturbance to the waterbirds around the lake, but any increase in the extent or intensity of the fishery would result in an increase in bird disturbance; grazing activity, together with associated human activity, may disturb breeding and migratory waterbirds there, and the nearby Ögiy *sum* (small settlement) is a further source of disturbance (Buckton *et al.* 1998).

Pollution At Ögiy Nuur, the nearby Ögiy *sum* may be a source of pollution through the Orkhon Gol inflow into the lake (Buckton *et al.* 1998). Water pollution is a threat to waterbirds in Henan (Wang Wenlin *et al.* 1998).

MEASURES TAKEN **Legislation** The Swan Goose is included in the Russian Red Data Book (Kolosov 1983). It is listed as “Rare” under the Mongolian Law on Hunting (1995), which means that it may only be hunted or trapped for special purposes, and it is also listed as “Rare” in the Mongolia Red Book (Bold 1987, 1997). The species was designated as South Korean natural monument no. 325 in 1985 (Won 1992). It is not nationally protected in China, but it is protected by wildlife laws in the following provinces, autonomous region and municipality: Beijing, Hebei, Liaoning, Heilongjiang, Shanxi, Henan, Hunan, Sichuan and Ningxia (SC).

Protected areas and habitat management *Russia* This species is protected in a wildlife refuge that has existed in the Udył' lake basin since 1977 and which was designated as a Ramsar site in 1994, and a nature reserve is established in the Bolon' lake basin (B. A. Voronov *in litt.* 1997). The Torey lakes have been protected as a part of the Dauriski State Reserve since 1987,

and its former nesting localities at Lake Khanka lie within the boundaries of the Khanka State Nature Reserve (N. M. Litvinenko *in litt.* 1997). *Mongolia* Ögiy Nuur (Ugiy-Nur) in Arkhangai and Orog Nuur (Orok Nor) in Bayankhongor were designated as Ramsar sites in July 1998, and Khar Us Nuur National Park in Khovd and Airag Nuur in Uvs were declared in April 1999 (Ramsar Bureau information sheet). *Japan* The species has been recorded in or near to several sites important for wintering ducks and geese which have been designated as National Wildlife Protected Areas, including: Utonai-ko on Hokkaido, Izu-numa in Miyagi prefecture, Fukushima-gata in Niigata, Katano duck pond in Ishikawa, Nakanoumi in Tottori and Shimane, Izumi-Takaono in Kagoshima and Yonaguni in Okinawa (Environment Agency of Japan *in litt.* 1999). *Korea* Details of several measures taken for the protection of wetlands in South Korea are in the equivalent section under Baikal Teal and Spoon-billed Sandpiper *Eurynorhynchus pygmeus*. *Mainland China* Several nature reserves in China are known or suspected to be important for the conservation of this species, including: Zhalong, Xingkai Hu, Lianhuan Hu, Honghe and Sanjiang Nature Reserves in Heilongjiang; Xianghai Nature Reserve in Jilin; Dalai Hu, Horqin and Dalainor Nature Reserves in Inner Mongolia; Sanmenxia Nature Reserve in Henan; Shengjin Hu Nature Reserve in Anhui; Yancheng Nature Reserve in Jiangsu; Poyang Hu Nature Reserve in Jiangxi; and Dong Dongting Hu Nature Reserve in Hunan (see Liu Donglai *et al.* 1996, MacKinnon *et al.* 1996, Wang Wenlin *et al.* 1998).

Habitat protection Following the devastating floods of 1998, China announced some measures to protect wetlands and to stop reclamation: at some locations, including Poyang Hu lake, low-lying farmlands and settlements are to be converted back to lake and wetland; in early 2000, the Chinese government also announced that the agricultural development that has been proceeding for more than 40 years at the wetlands of Sanjiang plains in Heilongjiang will come to an end (SC).

MEASURES PROPOSED Legislation Given that unsustainable levels of hunting appear to be one of the main reasons for the decline in the numbers of this species (see Threats), an important measure for its conservation is the passing and enforcement of legislation in its range states to reduce hunting pressure, particularly at passage and wintering sites. In Russia measures are required to prevent poaching and disturbance of this species (V. A. Nechaev *in litt.* 1997), including a ban on spring hunting of wildfowl in the Russian Far East (N. M. Litvinenko *in litt.* 1997). In mainland China (which supports almost all of the global wintering population) it should be designated as a nationally protected species. Lu Jianjian (1993a) proposed that national and local hunting regulations should be formulated in China (based on scientific studies), to control the length of the hunting season, to limit the number of hunters and the bag size of each hunter, and to ban inappropriate hunting methods such as the use of punt guns and poisons.

Protected areas and habitat management *Russia* In Khabarovsk, Russia, the Udył' lake wildlife refuge should be upgraded to a strictly protected area, and the area around Chertovo lake should be designated as a reserve and linked to the adjacent Orlik wildlife refuge (AVA). In Primorye it is necessary to expand the Khanka State Reserve (Glushchenko and Shibaev 1996). The species's breeding and moulting habitats on Sakhalin should be protected, particularly those on the north-west coast of the island (V. A. Nechaev *in litt.* 1997). *Korea* Details of several measure proposed for the protection of wetlands in South Korea are in the equivalent section under Baikal Tea and Spoon-billed Sandpiper. *Mainland China* The management of nature reserves in the wintering areas of this species in mainland China needs to be improved, particularly to address the problem of a lack of experienced personnel (Lu Jianjian 1993a). Changes to the wetlands in the Yangtze valley (see Threats) and the threatened waterbirds that occur there should be carefully monitored once the Three Gorges Dam is in operation, and appropriate efforts made to mitigate the problems that arise (see equivalent section under Siberian Crane *Grus leucogeranus*).

Research In Khabarovsk, Russia, surveys are required to investigate the status of this species on the shores of Alexandra, Nikolay, Ul'banski and Tugurski bays (AVA), and similar surveys are required in potentially suitable areas in Primorye (N. M. Litvinenko *in litt.* 1997). Populations in China should continue to be surveyed and monitored at the sites where significant numbers have occurred in the past, and at other wetlands with the potential to support important populations, with the aim of improving understanding of the pressures that it is facing and developing appropriate conservation measures. In this regard it is highly desirable to conduct a detailed study of hunting activities throughout the winter range of the Swan Goose in an attempt to determine the contribution hunting is making to the alarming decline in its numbers. Moreover, intensive biological fieldwork is needed in breeding areas to determine what factors limit breeding success.

Conservation education It will be important to back up any new hunting legislation, or increased efforts to enforce existing legislation, with publicity to explain why this type of action is being taken. Lu Jianjian (1993a) proposed that public awareness programmes should be launched through radio, television, films, exhibitions, posters and publications to educate Chinese people about the importance of conserving waterfowl, and that these programmes should be targeted particularly at people in the remotest and poorest areas, where it will be important to create alternative job opportunities for local hunters.

REMARKS (1) The Swan Goose is probably best treated as a member of the “grey goose” genus *Anser*, but it is highly distinctive with its large bill, short legs and contrasting head and neck pattern, and has sometimes been separated into its own genus *Cyanopsis*.