

Threatened Birds of Asia:

The BirdLife International Red Data Book

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PALLAS'S FISH-EAGLE

Haliaeetus leucoryphus

Critical —
Endangered —
Vulnerable C1



This species is inferred to have a small, declining population as a result of widespread loss, degradation and disturbance of wetlands and breeding sites throughout its range. It therefore qualifies as Vulnerable.

DISTRIBUTION Pallas's Fish-eagle (see Remarks 1) is widespread in central, southern and eastern Asia with occasional records west into Europe. In this account attention is focused on the status of the species in the Asian portion of its range.

Outside the Asian region The extralimital range of the species lies in Kazakhstan, Tajikistan, Uzbekistan, Iran and Afghanistan, the last two of which it visits as a non-breeding visitor (to the Seistan swamps, south Caspian Sea and the Persian Gulf) (Cramp and Simmons 1980). Breeding has not been confirmed in Tajikistan, but passage and non-breeding visitors occur at waterbodies in the south of the country and the Pamir mountains (Abdusalyamou 1971). Similarly, no nests are known in Uzbekistan, but breeding is considered probable on the eastern Aral Sea and in the Amudarya valley where there are (or were until recently) frequent sightings, although some of these probably refer to non-breeders or birds moving north after breeding in India (Sagitov and Meklenburtsev 1987; but see migration). In Turkmenistan, too, records are considered to relate to dispersing non-breeders (Dement'ev and Gladkov 1951–1954). In Kazakhstan Pallas's Fish-eagle formerly summered regularly and in some numbers in the Volga–Ural steppes and it is generally more regular in the west of the country, over half of c.50 records during 1970–1995, including five in the breeding season, coming from the area between the Volga, Ural and Emba rivers (Gavrin *et al.* 1962, Varshavskiy 1983, Berezovikov 1991, A. Kovshar' *per* A. Bräunlich *in litt.* 2000). There are further widespread reports of birds in summer from the north of the country (e.g. Turgay depression, Kurgal'dzhino) as well as the south and south-east. One was collected in the southern Altay in 1966, but Berezovikov (1989) recorded none there in the period 1978–1986. There are few breeding records (even these perhaps not all this species: Gavrin *et al.* 1962) in Kazakhstan, where the range apparently once extended from the north-east shores of the Caspian Sea (last bred 1947) east to the Aral Sea, Syrdarya river and Balkhash lake–Ili river area; according to Finsch (1879), a nest was found even further east at Lake Markakol' (Altay) in 1876. After dramatic declines in these areas (see Population), observations suggested breeding may have taken place on or near the Ili river in the 1980s: in the Ili valley close to the Malaysary mountains, two adults were recorded in May 1985, single birds in June 1985 and May 1986; some 100 km further east in the valley (near the Kalkany mountains), single birds were seen in July and August, and two displaying birds in August 1989 (Berezovikov 1991, A. Kovshar' *in litt.* to A. Bräunlich 2000). Stragglers have occurred elsewhere from Ukraine, Crimea, and the Sea of Azov to eastern Caucasus, but it is now only an accidental visitor to these regions (Cramp and Simmons 1980). Similarly, it was once a regular winter visitor to Iraq in small numbers (Allouse 1953), but this no longer appears to be the case (Cramp and Simmons 1980). It has occurred further west into several European countries as a vagrant (Cramp and Simmons 1980), although there appear to be no recent records.

Asian region The species occupies a broad range from Pakistan and eastern Russia in the west to China in the east, and from Russia in the north to Myanmar in the south, with stragglers reaching as far afield as Thailand and Cambodia. There are possible records for

South Korea (see Remarks 2) and Vietnam (see Remarks 3), but neither of these has been confirmed. One population breeds in the northernmost portion of the range, migrating south in the non-breeding season, while another population breeds in the south, with many individuals migrating north after breeding (see Ecology).

■ **RUSSIA** In eastern Russia, it is recorded from Baikal lake and Ust'-Barguzin (probably nesting) and south-east Transbaykalia (Dement'ev and Gladkov 1951–1954), with records from:

■ **Irkutsk Baikal lake**, November 1871 (specimen in ZMB); **Irkutsk** (Irkoutsk), 1896 (specimen in MNHN); near **Utulik**, Baikal mountains, October 1913 (specimen in NHMW);

■ **Chita Chikoy river** (Tchikoy river), south-west Transbaykalia, one collected, April 1896 (Kozlova 1932–1933).

■ **MONGOLIA** It is a widespread, presumably breeding visitor to Mongolia in spring to autumn, especially numerous in the Great Lakes basin and at lakes in the Gobi desert. Records are as follows: ■ **Uvs Uvs Nuur**, female, August 1962 or 1964 (Piechocki 1968); **Ayrag Nuur**, six adults and 15 immatures, June 1995 (A. Bräunlich *in litt.* 2000); ■ **Bayan-Ölgii Achit Nuur** lake, immature male, July 1962 or 1964 (Piechocki 1968; also Fomin and Bold 1991); ■ **Khovd Buyant river** (Bujant Gol), one immature, May 1995 (A. Bräunlich *in litt.* 2000); **Chono Kharaiikh river** (Conocharajch-gol), one seen, June 1978, being harassed by a Saker *Falco cherrug* (Piechocki *et al.* 1981), one adult and one immature, May 1995 (A. Bräunlich *in litt.* 2000); **Khar Nuur** (Har Nuur) lake, undated (Fomin and Bold 1991); steppe near **Khovd river** (Kobdothal), May 1901 (specimen in AMNH); **Khar Us Nuur** (Har Us Nuur) lake, undated (Fomin and Bold 1991), one immature, May 1995 (A. Bräunlich *in litt.* 2000), August–October 1996 (Kováts *et al.* undated); **Döröö Nuur** (Durgun Nuur), undated (Fomin and Bold 1991); **Bulgan**, “encountered quite commonly”, July 1962 or 1964 (Piechocki 1968); Dalai Nuur lake (untraced), one adult, May 1995 (A. Bräunlich *in litt.* 2000); 60 km from Mandal-Gobi, one probable seen, April 1977 (Stephan 1994); ■ **Gov'-Altai Dzavkhan river** (Zavkhan river), undated (Fomin and Bold 1991); ■ **Khövsgöl Hövsgöl lake** (= Khövsgöl Nuur, Chövsgöl, Kosso-gol), December 1912 (Piechocki 1983, specimen in NHMW), undated (Fomin and Bold 1991); ■ **Arkhangai Tamir river** (= Tamirīn Gol), Khangai, one collected, July c.1926, and in the eastern outskirts of the Khangai the last straggler was noted on 22 September (Kozlova 1932); **Ögiy Nuur** (Ugij-nur), immature male collected, June 1962 or 1964 (Piechocki 1968); ■ **Bayankhongor Boon Tsagaan Nur** (= Buncagan-nur), a female collected in June 1962 or 1964 (Piechocki 1968); **Orog Nuur** lake, “numerous” on spring migration in 1926 (Kozlova 1932–1933); ■ **Övörkhangai Khujirt** (= Chudshirt) region, immature, June 1980 (Königstedt and Gleinich 1988); ■ **Selenge Orkhon river** (= Orhon Gol), one adult flushed from a tall poplar tree east of the Orkhon waterfall, June 1978, with an immature bird later seen (Mauersberger 1979), also one adult seen east of the Orkhon waterfall, August 1979, and one adult seen flying into a very old poplar forest in June 1980, taken to indicate that it breeds in this region (Mauersberger *et al.* 1982), two, June 1989 (Stephan 1994); ■ **Töv** the Tola river, near **Ulaanbaatar**, one, May 1979 (Stephan 1994); **Tola river** valley, breeding recorded in c.1926 (Kozlova 1932–1933); ■ **Dornogov' Bayan Bogdo** (“Boyan, Bogdo”), September 1933 (specimen in NRM); ■ **Dornod Mongol Daguur Strictly Protected Area**, reported to be a very rare visitor that probably breeds in the area, undated (Tseveenmyadag *in litt.* 1997); **Numrug Strictly Protected Area** (Nömörög), reported to be a rare breeding visitor, undated (Tseveenmyadag *in litt.* 1997); province unknown “Ussuk” (untraced), undated (specimen in AMNH).

■ **CHINA** It breeds at c.3,200–4,700 m in Heilongjiang, Inner Mongolia, Xinjiang, Tibet, Qinghai and Gansu, and is suspected to breed in northern Sichuan (Wang Xiangting 1991, Zheng Shengwu 1994), and there have been occasional records in Hebei, Shanxi and Shanghai (see Remarks 4). Records are as follows:

■ **Heilongjiang Wudalianchi city**, male collected, June 1937 (Xu Xueliang *per* Gao Wei *in litt.* 1997); **Hulan Ergi** (= Fuljaerdi), 15 km north-west of Qiqihar (Tzitzikar), male collected, May 1928 (Meise 1934); **Zhalong National Nature Reserve**, Lindian county, August 1980 (Liu Mingyu *et al.* 1988); **Harbin**, October 1939 (specimen in FMNH);

■ **Inner Mongolia** near **Lamagulusu** (Ramagurusu), 10 km south-east of Dalai Hu (Dalainor), Chen Barag Qi, May 1935 (specimen in YIO), one collected, May 1956 (Piechocki 1956); **Dalai Hu National Nature Reserve** (Hulun Nur, Talai Noor, Dalainor Barga), singles collected on the southern shore and in the desert to the west of the lake, June 1924 (Seys and Licent 1933), also in June 1935 (Ma Jianzhang *in litt.* to Gao Wei 1997), September 1940 (specimen in AMNH), and singles recorded, August 1996 and July 1997 (Wuliji and Liu Songtao *in litt.* 1998); Tumeeji Sum, **Jalaid Qi**, one seen, June 1996 (Liu Bowen *in litt.* 1998); **Xilin Gol** (Sjiling gol), one collected, June 1924 (Seys and Licent 1933); **Dalai Nur Nature Reserve**, Hexigten Qi, Chifeng city, several, April 1995 (Arongqiqige *in litt.* 1998); **Uiansuhai Nur** (Wuliangsuhai), May–August 1960 (six) and July 1964 (seven specimens in ASCN), “common” in the 1950s and 1960s, but now almost extinct in this locality (Yang Guisheng *et al.* 1998), one seen, March 1987, two, April 1991, “rare here now” (Xing Lianlian *et al.* undated); **Taolimiao-Alashan Nur**, Ordos plateau, April (unspecified years) (He Fenqi *et al.* 1996); **Ordos desert** (“Pays de T’eng keou, ordos O.”, on the Yellow river), one, July 1923 (Seys and Licent 1933), June 1993 (P. Alström, U. Olsson and D. Zetterström *in litt.* 2000);

■ **Xinjiang** (where it breeds in the steppes, oases and deserts near the Altay and Tien Shan mountains: Yuan Guoying 1991) **Chardingjy**, Lingcha to Hom Hanas Mongolzu Xiang (Hanas Hu), adult seen, August 1989 (Dissing *et al.* 1990); **Ulungur Hu** (Wu Lun lake), adult associating with a juvenile, June 1995 (Hornskov 1995b; also Ma Ming *in litt.* 1997); **Nalatie**, juvenile seen, August 1989 (Dissing *et al.* 1990); **Bayanbulak**, seen in recent years (Ma Ming *in litt.* 1997); south of **Hami**, up to three immatures on fishponds, July 1999 (Dornbusch and Dornbusch 1999), breeding in Hami (Kumul) district (Zheng Shengwu 1994); **Hejing county**, August 1958 (two specimens in ASCN), breeding, undated (Zheng Shengwu 1994); **Tarim basin**, seen in recent years (Ma Ming *in litt.* 1997), including on the upper reaches of the Tarim river, resident, undated (Zheng Shengwu 1994); **Kashi** (Kashgar), one collected, January 1930 (Ludlow and Kinnear 1933–1934), breeding in Kashi (Kaxgar) district, undated (Zheng Shengwu 1994); **Shache county** (= Yarkand) and Yecheng county (Karghalik), several seen, 1870 (Henderson and Hume 1873), and near Shache county, several sightings, June–July 1874 (Scully 1876); **Igachi**, August 1874 (Scully 1876); Tungtash, c.10 km east of **Ye Cheng** (= Karghalik), August 1874 (Scully 1876); **Moyu county** (Karakax), breeding, undated (Zheng Shengwu 1994); **Hotan district**, breeding, undated (Zheng Shengwu 1994); Dilpar (untraced), “eastern Turkestan”, May 1934 (juvenile in NRM); You’erduisi steppe (untraced), resident, undated (Zheng Shengwu 1994);

■ **Tibet Zunthulphuk**, east of Kangrinboqê Feng (Mount Kailas), 4,880 m, June 1945 (Ali 1946); **Lha Chhu**, west of Barga (Barkha), c.4,630 m, June 1945 (Ali 1946); **Gyanyima Tso** (Gyanima Tso), Kangrinboqê Feng–Mapam Yumco (Kailas–Manasarowar) region, July 1945 (Ali 1946); **Chiu Gompa** (Jiu Gompa), Ganga Chhu, only a single pair seen (by Ludlow in September 1932 (Ali 1946); **Ding Tso**, north-east of Mapam Yumco (= Manasarowar lake), c.4,630 m, June 1945 (Ali 1946); **Gossul Gompa**, west shore of Mapam Yumco (= Manasarowar lake), June 1945 (Ali 1946); **Rakas Tal** (Rakhas Tal), Kangrinboqê Feng–Mapam Yumco (Kailas–Manasarowar) region, a pair seen along the Manasarowar–Rakhas Tal channel, near the Jhui monastery, 1932 (Ludlow ms), June 1945 (Ali 1946); **Ngayeze**, south-west shore of Mapam Yumco, 4,660 m, June 1945 (Ali 1946); **Lhasa**, “often seen”, August–September 1904 (Walton 1906, also Vaurie 1972), July 1986 (Turton and Speight 1986), one by the Lhasa river on the eastern outskirts of the city, June 1997 (R. M. Thewlis *in litt.* 1999); **Yamdruk Tso** (Yam Dok Cho), “common” there and at other large lakes, 1904 (Walton 1906); **Nyang-chu** river, between Bam Tso (= Hram Tso) and Gala Co (= Kala Tso) lakes

and Gyangzê (Gyantse; the sighting being c.7 km upstream of there), “not uncommon”, 4–5 individuals, April–May 1926 (Ludlow ms, 1927–1928); northern **Changdong** (Chang Tang), undated (Kozlov 1899 in Vaurie 1972); **Kala Tso**, “common” in spring and summer (especially around this lake), mid-1920s (Ludlow 1927–1928), “common”, 1946 (Maclaren 1947b, 1948); **Bam Tso** (= Hram Tso), “common” in spring and summer (especially around this lake), “large numbers” seen (and one collected), July 1925, all of them gorged with fish (Ludlow 1927–1928), “common”, 1946 (Maclaren 1947b, 1948); **Tuna**, a few miles to the north of the Tang La pass and c.5 km to the west of Chumolarhi, southern Tibet, “moderate numbers”, 4,570 m, January–April 1904 (Walton 1906); Parkha plain (untraced), “fairly common”, perched singly near the various streams which meander across the plain, 4,600 m, July 1954 (Lavkumar 1955);

■ **Qinghai Qilian Shan** mountains, three males and a female collected, undated (INPZAS 1989); **Gurab Angir Gol**, August (unspecified year) (Vaurie 1972); **Tianjun county**, July 1957 and June 1959 (two specimens in ASCN); **Qinghai Hu** (= Koko Nor) lake, Gangcha county, August 1909 (three in NRM), one collected on the north-east shore, two juveniles at “Bagha Oula” on the north shore, and a juvenile at “Lombou sehr tch’inn” on the south-east shore, September 1918 (Seys and Licent 1933), two collected in the “western hills of Kokonor grass country”, and an adult on the south shore, September 1925 (Bangs and Peters 1928, specimen in FMNH), September 1960 (three), May 1966 (four specimens in ASCN and WUCN), collected at “Urto” in September (unspecified year) (Vaurie 1972), “a good breeding population” (Scott 1989), adult seen at Bird island, 3,270 m, April 1988 (Nickel 1988), five seen, May 1993 and May 1995 (Holt 1995), up to seven, June 1995 (P. Alström, U. Olsson and D. Zetterström *in litt.* 2000); **Qaidam basin** (Zaidam), August (unspecified year) (Vaurie 1972); **Haiyan county** and Menyuan county, male and two females collected, June–July 1958 (Cheng Tso-hsin 1963); Xining Ho (Hsi-ning ho), near **Xining** (Hsi-ning), August (unspecified year) (Bianchi 1916 in Stresemann *et al.* 1937–1938; also Vaurie 1972); **Gonghe county**, May–June 1959 (four specimens in ASCN); **Kung-ho-ku-chih**, south of Xining, May (unspecified year) (Vaurie 1972); **Burchan Buddha Ula** (Burchan Buddha range), August (unspecified year) (Vaurie 1972); **Chasora river**, Xinghai county, May (unspecified year) (Vaurie 1972); **Tsurumun Chu**, Xinghai county, May (unspecified year) (Vaurie 1972); sources of **Huang ho**, near Ngoring Hu, May (unspecified year) (Vaurie 1972); **Jiang Cuo** lakes, adult and juvenile, September 1995 (Allen and Thorpe 1995); **Camp 71**, 1934 (Schäfer and Meyer de Schauensee 1938); **Yushu county**, summer visitor, unspecified years (Zheng Shangwu 1994); **Camp 91**, near Xiao Surmang, May 1934 (Dolan 1938, Schäfer and Meyer de Schauensee 1938, Vaurie 1972); **Nanqian**, adult, September 1995 (Allen and Thorpe 1995); Manyuan (untraced), undated (Li Dehao 1989);

■ **Gansu Gaxun Nur and Sogo Nur** (Tsondol), one collected at the Ejin river (Edsin Gol), August 1929 (Lönnerberg 1931a, specimen in NRM); **Jiuquan county**, summer (unspecified years) (Zheng Shangwu 1994); **Subei county**, summer (unspecified years) (Zheng Shangwu 1994); **Aksay county**, summer (unspecified years) (Zheng Shangwu 1994); **Zhangye county**, summer (unspecified years) (Zheng Shangwu 1994); **Sunan county**, summer (unspecified years) (Zheng Shangwu 1994); **Wuwei county**, winter visitor (unspecified years) (Wang Xiangting 1991); **Tianzhu county**, winter visitor (unspecified years) (Wang Xiangting 1991); **Nienpaih sien** (Nien pé), one collected, August 1918 (Seys and Licent 1933, also Stresemann *et al.* 1937–1938); near **Lanzhou**, two juveniles collected (one at “Tai t’ong”), July and December 1918 (Seys and Licent 1933, also Stresemann *et al.* 1937–1938, Wang Xiangting 1991); **Heshui county**, winter visitor (unspecified years) (Wang Xiangting 1991); **Wushan county**, winter visitor (unspecified years) (Wang Xiangting 1991); **Tianshui county**, winter visitor (unspecified years) (Wang Xiangting 1991);

■ **Sichuan Zoigê** marshes, two males collected (undated) (Li Guiyuan 1995; also Li Guiyuan *per* Gao Wei *in litt.* 1997); **Serxu county** (Shiqu), undated (Li Guiyuan 1995); **Camp 139**, near

Woinbogoin, Sêrxü county, September 1934 (Dolan 1938, Schäfer and Meyer de Schauensee 1938; also Vaurie 1972, Cheng Tso-hsin 1987); **Hongyuan county**, undated (Li Guiyuan 1995); **Songpan county**, two males collected at “Camp 11” and “Camp 13”, some miles north-west of Songpan (Sungpan), August 1931 (Stone 1933), undated (Li Guiyuan 1995); **Garzê prefecture** (Ganzi prefecture), “small numbers” in alpine areas, undated (Dai Bo *et al.* 1994); one-and-a-half days’ march north of Tongolo (untraced), Sichuan/Yunnan, one seen “along one of the numerous rivers”, 3,850 m, July 1929 (Stevens 1930);

■ **Shanxi** “Tch’inn t’a, near Linn Hien” (untraced, mapped as in Shanxi), southern Shanxi, one collected, May 1918 (Seys and Licent 1933, also Cheng Tso-hsin 1987);

■ **Hebei** unspecified localities, undated (Wilder in Thomas 1978, Cheng Tso-hsin 1987);

■ **Henan** Taihangshan Macaque Nature Reserve, **Jiaozuo**, a passage migrant, seen in open areas near mountains and rivers and lakes, undated (Qu Wenyuan and Song Chaoshu 1996b);

■ **Jiangsu** unspecified localities, recorded during surveys between 1982 and 1990 (Li Guozhong *et al.* 1991);

■ **Shanghai Shawaishan island** (Sha-wei-shan) (see Remarks 4), one collected on “Saddles islands”, July 1885 (Sowerby 1943), immature collected, January (unspecified year) (Styan 1894; also La Touche 1925–1934, Sowerby 1943, Huang Zhengyi *et al.* 1991);

■ **Zhejiang** unspecified localities, undated (Zhu Xi and Yang Chunjiang 1988).

Unconfirmed reports from outside the range documented by Cheng Tso-hsin (1987), and which therefore require confirmation, are from Tianjin and Beijing municipalities, undated (Wilder in Thomas 1978).

■ **PAKISTAN** This species originally occurred (and bred) in many districts of Punjab and Sind, wherever wetlands or waterways were available, and frequented the Indus and other major rivers from their mouths to their upper reaches (Hume 1872–1873); it has more recently become rare and localised (Roberts 1991–1992), and is now only occasionally encountered, being generally restricted to the lakes of southern Sind, with small numbers in Punjab and North-West Frontier Province (Roberts *et al.* 1986, Roberts 1991–1992). There is one old record from Baluchistan (see Remarks 5). Records are from: ■ **North-West Frontier Province Chitral fort**, a pair, 1902–1903 (Perreau 1910); Indus river, **Baltistan**, two, July, unspecified year (Matthews 1941); **Deosai plains** (Deosai plateau), 3,650–4,250 m, “often seen”, August, 1925–1926 (Meinertzhagen 1927), 3,950–4,500 m, one “sailing high over”, June–August 1941 (Matthews 1941); Kabul river, near **Peshawar**, one, January 1926 (Briggs and Osmaston 1928); between **Chikarkot** (Chikargot) and Hangu, Kohat, occasional, 1904–1906 (Whitehead 1910–1911); Indus river, near Kohat, and thus in the region of **Khushalgarh**, “resident and common”, with “four pairs nesting there in March”, 1904–1907 (Whitehead 1910–1911); **Dera Ismail Khan district**, rare but regular, particularly in the Chasma barrage area, October–April, 1988–1998 (Kylänpää 1997, 2000); ■ **Baluchistan Ormara**, December–April, undated ([J. W. N. or W. D.] Cumming in Ticehurst 1926–1927); ■ **Sind Bori Bunder station**, presumably near **Bori**, regularly breeding, c.1880s (Inverarity 1886–1888); **Kandhkot**, Jacobabad district, undated (Roberts 1991–1992); **Ghauspur jheel**, six, 1972 (Koning and Walmsley 1972); **Sukkur**, 1970–1974 (Koning 1976) and Nama Dingno, Sukkur district, one, February 1988 (Hirschfeld *et al.* 1988); **Eastern Narra**, breeding, November and December, undated (Doig 1879), November 1878 (Barnes 1888–1891); **Rohri**, undated (Brooks 1879); **Larkana**, “several pairs”, January 1872 (Hume 1872–1873, specimen in BMNH); **Jamrao head**, 1970–1974 (Koning 1976); **Manchar lake**, Dadu district, 50 m, “several” active nests, January 1872 (specimens in BMNH), 1970–1974 (Koning 1976); **Sadori lake**, 50 m, 1970–1974 (Koning 1976; also Rao 1989b); **Sangriaro**, 1970–1974 (Koning 1976); **Sunari** (Soneri) **lake**, Sanghar district, December 1939 (two specimens in FMNH); between Sehwan and Hyderabad on the Indus river, presumably in the region of **Hala**, “a few birds”, January

1872 (Hume 1872–1873); Borthie, near **Dhoro Naro**, 1970–1974 (Koning 1976); **Khinjar lake**, January–February 1934 (six specimens in UMMZ); **Chatteji lake**, 1970–1974 (Koning 1976); **Karachi**, four at refuse dump, November 1966 (Mountfort and Poore 1968); **Haleji lake** (Haleji dhand), pair at nest, November 1966 and November 1967 (Mountfort and Poore 1968), 1970–1974 (Koning 1976), one, December 1977 (D. Rogers *in litt.* 1999), one, February 1988 (Hirschfeld *et al.* 1988); **Charwo lake**, 1970–1974 (Koning 1976); **Dabhko lake**, 1970–1974 (Koning 1976); **Phoosani (Phoosna) lake**, 1970–1974 (Koning 1976); **Sujawal bridge** (Sujawala), breeding, 1980s (Roberts 1991–1992); canals around **Badin**, 1970–1974 (Koning 1976); **Thatta (Tatta) district**, four eyries, late 1980s (Roberts 1991–1992); **Mahboub Shah lake** (Mehboub Shaw, Maboobshah), 1970–1974 (Koning 1976); ■ **Punjab** 8 km below **Attock**, on the Indus, a nesting pair, 1918–1919 (Jones 1921) and a “well-feathered chick” found near Attock, March c.1926 (Whistler 1930); one near **Rawalpindi**, on the opposite side of the Sohan river, January 1926 (Whistler 1930); a recently active (regular) nest on the Jhelum river two miles upstream of **Jhelum** city, April 1913 (Whistler 1913, Whistler and Ticehurst 1916); **Kallar Kahar lake**, 100 m, breeding visitor, 1918–1948 (Waite 1948); **Nammal**, Mianwali district, January 1933 (juvenile in BMNH), present, 1918–1948 (Waite 1948); **Punjab salt range**, breeding at all lakes except Jahlar, 1918–1948 (Waite 1948), more recently scarce (Roberts 1991–1992); between Jhelum and **Pind Dadan Khan** (Phindhadun Khan), several pairs, November 1871 (specimen in BMNH, Hume 1872–1873); **Sialkot**, “occasionally seen”, undated but pre-1950 (Whistler ms); **Wazirabad**, Gujranwala district, January 1907 (specimen in BNHS, Abdulali 1968–1996), and in Gujranwala district as a whole, “occurs and breeds”, March–October 1915 (Whistler 1916c); **Lahore**, pair resident and breeding nearby, c.1910–1915 (Currie 1916a); around the confluence of the Ravi and Chenab rivers, thus around **Ahmadpur Sial**, 2–3 pairs in a c.48 km stretch of river, November 1871 (Hume 1872–1873); **Taunsa barrage**, 1970–1974 (Koning 1976); **Multan**, November 1931 (BMNH egg data); **Hamzewali**, Muzaffargarh district, December 1936 (juvenile in BMNH); **Lal Suhanra National Park**, Patisar lake (Lal Suhanra, Suhara, Sohanran), undated (Rao 1989b, Roberts 1991–1992), two, October 1966 (Mountfort and Poore 1968), 1970–1974 (Koning 1976); **Bahawalpur**, on the Sutlej river, January–March 1939 (Ali 1941); around the junction of the Chenab and Sutlej rivers, and therefore near **Alipur**, one, December 1871 (Hume 1872–1873); Kali dhand, Bahawalpur district, male, January–March 1939, and in the same district at **Jajjah-Abbasian**, March 1939 (Ali 1941).

Untraced localities are: Dho, 1970–1974 (Koning 1976); Jafferli, 1970–1974 (Koning 1976).

■ **INDIA** Pallas’s Fish-eagle is a widespread breeding species on lakes and large rivers in the north and north-east of the country. There are unconfirmed records from the south in Karnataka, Tamil Nadu and Andhra Pradesh (see Remarks 6).

■ **Jammu and Kashmir** The species was evidently very common in the valley of Kashmir at one time. It has probably declined, although the recent dearth of records is partly the result of reduced accessibility. Records are from: **Wular lake**, resident (Unwin 1897), female, September 1891 (Richmond 1895), female, September 1895 (Oberholser 1900), July 1936 (specimen in FMNH), July 1937 (specimen in BMNH), common, 1944 (Loke 1946); between Khalsar and **Tirit**, on the Shyok river, June–July 1929 (Ludlow and Kinnear 1933–1934); **Bandipur**, July 1936 (specimen in FMNH); **Haigam Rakh** (Haigan Rakh), up to five resident, up to 1989 at least (Scott 1989); **Gandarbal**, breeding annually in 1890s (Davidson 1898b); between **Baramula** (Baramulam) and Srinagar, on the Jhelum river, April–May 1896 (Davidson 1898b); **Leh**, Ladakh, May, 1925–1926 (Meinertzhagen 1927), 1928 (Ludlow ms), summer of 1929 (Ludlow and Kinnear 1933–1934); **Hokarsar**, resident until 1989 at least (Scott 1989); on the Jhelum river “just above” **Srinagar**, “a pair or possibly more”, 1920 (Whistler 1922b), also two pairs downstream between Srinagar and Wular lake, 1920s (Bates 1924–1926), March 1925 (specimen in BMNH), juvenile taken from the nest, March, 1925–1926 (Meinertzhagen 1927); below **Upshi**, in the Indus valley, 3,650 m, June 1923 (Osmaston

1925); **Chushul** (Shushal), pair, 1925–1926 (Meinertzhagen 1927), 1928 (Ludlow ms); **Marbul pass** (= Merbal glen), one, June 1942 (Bates 1949); **Tso-Moriri lake**, Ladakh, 5,200 m, a pair with an immature, June 1923 (Osmaston 1925), 1928 (Ludlow ms); Hanle river, presumably in the region of **Hanle**, Rupshu, Ladakh, male, September 1897 (Oberholser 1900); Sambal, here presumed to be **Samba**, adult, May 1969 (Brown and Greensmith 1969); **Madhopur**, undated (A. E. Jones in Whistler ms); around Domal (untraced), two, c.1929 (Osmaston 1930).

■ **Himachal Pradesh** Records are from: **Pong Dam lake** (Pong Lake Sanctuary), on the Beas river, undated (Whistler 1926b), 1988–1992 at least (Scott 1989, Pandey 1993c); **Spiti valley**, 3,800 m, one, June 1995 (Rana 1997); **Chakki Khad**, tributary of the Beas river, occasional, 1921–1923 (Whistler 1926b); breeding along the Beas river at **Sujanpur** and at Indaura, 1921–1923 (Whistler 1926b); between **Theog** and Mattiana, Simla hills, 2,450 m, 1908–1918 (Jones 1919); Hemis High Altitude National Park and Great Himalayan National Park (unconfirmed), listed by Samant *et al.* (1995; but see Remarks 7).

■ **Punjab** Records are from: Shivalik range (not mapped), recorded, May–July 1982 (Ali *et al.* 1982); **Harike Lake Wildlife Sanctuary**, Amritsar district, recorded, 1981–1982 (Ali *et al.* 1982); **Rupar**, December 1915 (nesting) and March 1916 (Whistler 1918); **Firozpur** (Ferozepore), April 1902 (BMNH egg data), an adult and clutch of three eggs collected at Chingali jheel, November 1911 (specimen in BMNH, Whistler ms), and at Maslika, on the Sutlej (here forming the border with Pakistan), March 1935 (specimen in BMNH); **Ludhiana district**, including at Ladhawal, June to October 1917 (Whistler 1919), with two nests, undated (Whistler ms); **Fazilka**, Firozpur, January 1912 (Whistler ms).

■ **Haryana** The species is a scarce visitor to the state, with records from: near **Mubarakpur** (Mubariqpur), Ambala district, February 1916 (Whistler 1918); **Bhattu** (Bhuttoo), Hissar, December 1867 (BMNH egg data); **Sirsa**, at Parwali lake, January–March 1933 (Koelz 1940, eight specimens in UMMZ), and at unspecified localities, December 1870 (two specimens in BMNH), February 1931 (specimen in FMNH), January–March 1933 (Koelz 1940); **Bhindawas Wildlife Sanctuary**, January 1996 (V. Tiwari *in litt.* 1996); Gurgaon at “Chundao lake” (untraced), February 1869 (two specimens in BMNH), and elsewhere in the same district at **Sultanpur National Park** (Sultanpur jheel), immature, January 1983 (Bult 1983); **Garhi Harsaru** (“Gurhi Hursroo”), February 1868, December 1869 (BMNH egg data); Ortu (untraced), January–March 1933 (Koelz 1940).

■ **Delhi** Records, none recent, are from: **Bawana**, north of Delhi, one regular pair, undated (Hutson 1954); **Delhi**, October 1875 (specimen in BMNH), fairly common on the Yamuna (= Jumna), 1931–1947 (Frome 1947–1948); **Okhla**, “several” nests on the Yamuna nearby, undated (Whistler ms), one, November 1924, a pair breeding, January–February 1925 (Basil-Edwardes 1926), and one regular pair until the 1950s (Hutson 1954).

■ **Rajasthan** There is apparently only one recent locality for the species in the state and even there it now occurs only erratically. Records are from: **Keoladeo National Park**, Bharatpur, December 1970–January 1971 (Aarestrup *et al.* 1971), two pairs, 1979–1980 (Breedon and Breedon 1982), four adults and an immature, December 1984 and January 1985 (Andersen *et al.* 1986), at least four, February 1988 (J.-C. Kovacs *in litt.* 1998), fairly common and nesting, January 1990 (Buckton and Morris 1990), but apparently usually absent since 1993/1994 (Loseby 1997) although occasional (mostly immature) individuals are reported; **Sambhar lake**, occasional, c.1870 (Adam 1873); **Jodhpur**, 1800s (Whistler 1938); the lake at “Kunkrowlee”, near **Udaipur**, March, undated (Hume 1878b).

■ **Gujarat** The lakes of the Kathiawar peninsula (and also south Gujarat) once hosted a breeding population, but the lack of recent breeding records suggests that this is no longer the case. Records, very few away from Kathiawar, are from: **Palanpur**, on the Banas river, occasionally seen, between 1944 and 1948 (Ali 1954–1955); **Kharaghoda** (Kharaghora), December 1901 (BMNH egg data); “not uncommon” around large lakes in Kathiawar,

specifically at **Nal lake** (“the Null”), undated (Lloyd 1873); **Viramgam**, nesting, pre-1900 (Abdulali 1972); between **Ahmedabad** and Deesa (Disa), regularly seen at wetlands (including at Palanpur, above), undated (Brooks 1875a); **Baoli** (Baolee), and at “Ajuk Ghair”, breeding, undated (Lloyd 1873); Ganga nal, 5–6 km west of **Mandvi**, one, 1947–1948 (Himmatsinhji 1970); **Kaira district**, December 1892 (BMNH egg data, *J. Bombay Nat. Hist. Soc.* 2: 150–151), with other untraced or illegible localities (e.g. “Bankria”, “Baikina” and “Kamijla”), where eggs or specimens were also apparently collected in December 1892 (BMNH egg and label data), possibly being in this district; **Than**, December 1894 (BMNH egg data); **Jamnagar**, one, January 1987 (G. Ouweneel *in litt.* 1999); **Golana**, on the Mahi river, occasionally seen, 1944–1948 (Ali 1954–1955); **Vadodara** (= Baroda), nesting, November, year unspecified (Barnes 1888–1891); **Vekaria** (Vekria), December 1892 (BMNH egg data); Jamara tank (untraced), Kutch, one, February 1980 (G. M. B. Sparks *in litt.* 2000).

■ **Uttar Pradesh** The species was evidently once very common and widespread in the state, but is now more scarce and local. Records are as follows: Dehra Dun district along the Yamuna and Ganges rivers (a few pairs breeding), and in hills as far north as **Tiuni**, north of Deoban, 3,000 m, 1930s (Osmaston 1935); below **Mussoorie**, up to eight, undated (Hume and Oates 1889–1890); **Asan barrage**, where an eyrie was occupied in 1984–1987 (Singh 2000), recorded as a “local migrant”, c.1994 (Gandhi and Singh 1995a,b); **Dehra Dun**, undated (Hume and Oates 1889–1890), and at Lechiwala, September 1948 (specimen in FMNH); **Kansrao**, breeding, undated (Osmaston 1935); **Hardwar**, December 1867 (BMNH egg data); **Rajaji National Park**, regular, 1986–1994 (Pandey *et al.* 1994) and Dholkand Rao riverlet, near Rajaji National Park, a pair, January 1991 (Singh 2000); **Saharanpur**, undated (Brooks 1879), pre-1887 (specimen in BMNH); **Corbett National Park**, about five, March 1979 (Halberg and Petersen 1984), two, November 1988 (Bose *et al.* 1989), a “few” along rivers, February 1990 (Buckton and Morris 1990), adult, March 1993 (J.-C. Kovacs *in litt.* 1998), c.10 seen, including three breeding pairs, January 1995 (P. Alström, U. Olsson and D. Zetterström *in litt.* 2000), one or two, December 1997 (A. Holcombe *in litt.* 1999); **Kaladhungi**, Naini Tal, “rare”, February–April 1989 (C. Salt *in litt.* 1990); **Meerut**, winter visitor, 1980–1983 (Sharma *et al.* 1983); **Garhmuktesar** (Garh Mukhteshwar; Gurmukteswar), December 1906 (BMNH egg data); **Dudwa National Park**, listed (Chandola 1978), and apparently common at Bankey taal, undated (Singh and Singh 1985); **Hindan river**, undated (Hutson 1954); “Nokheri forest” (specimen label data), presumed here to be North Kheri forest and thus in **Kheri district** (see Distribution under Bengal Florican *Houbaropsis bengalensis*), May 1923 (specimen in AMNH); **Fatehgarh**, February and November 1870, February 1873 (specimens in BMNH, A. Anderson 1871a), February 1938 (specimen in FMNH); **Agra**, February 1893 (specimen in NHMW), an eyrie c.16 km west of the city, undated (Lowther 1944), and on the Yamuna (= Jumna) river, undated (specimen in FMNH), not far from Agra, c.1941 (Lowther 1941); **Gonda**, breeding November–December annually (Field 1922); **Fatehabad**, January 1868 (BMNH egg data); **Lucknow**, pre-1881 (Reid 1887), and in Avadh (“Oudh”) in general, “very common” in winter, 1857–1860 (Irby 1861), November and December 1873 (two specimens in BMNH), January and February 1874 (two in BMNH); **Nawabganj Priyadarshani Sanctuary**, undated (Scott 1989); **Etawah**, January 1867 (specimen in BMNH), 1867 (four specimens in BMNH), February 1868 (specimen in NMS), breeding by the Yamuna, December 1898 (BMNH egg data), pre-1885 (specimen in BMNH), at Chambal river, near Etawah, December 1867 (BMNH egg data), and near Rahun, January 1868 (BMNH egg data); **Gorakhpur**, widespread in the district, 1909–1911 (Osmaston 1913), including at Chouk, January 1910 (specimen and two eggs in BMNH); **Jheenjuck jheel**, November 1870 (specimen in MM); **Ghosi** (Ghosi jhil), Azamgarh district, a pair, December 1930 (Briggs 1934); **Mainpur** (Mainpuri), February 1867 (specimen in BMNH), around 1930s (Lowther 1944); **Allahabad**, November 1874 (BMNH egg data), a pair every half mile along the Ganges, five nests between Jhusi and Mhow Serai ghats (Hume and Oates 1889–1890).

■ **Madhya Pradesh** The species has appeared at scattered localities throughout the state, as follows: Gwalior, on the Chambal river (“Gwalior–Dholpur boundary”), presumably near **Dholpur**, around April 1938 (Ali and Whistler 1939–1940); **National Chambal Sanctuary**, undated (Sharma and Singh 1986); Dhola tank, **Narwar**, September 1868 (specimen in BMNH); Dihaila jheel, in **Karera Bustard Sanctuary**, two immatures, January 1986 (Rahmani 1986b); Panghur lake, **Nimach** (= Neemuch), December, 1883–1885 (Barnes 1886); **Pench National Park** (Tiger Reserve), listed, undated (Anon. 1993); reported from unspecified localities along the Mahanadi river (therefore in either Orissa or Madhya Pradesh), undated (E. A. D’Abreu in Whistler ms), and on the same river between Tora and Dungari (slightly downstream of **Chandarpur**), four, April 1990 (Sharma *et al.* 1995); **Indravati river**, undated (E. A. D’Abreu in Whistler ms).

■ **Maharashtra** The species appears to be a rare vagrant to the state with only one certain record: Vihar lake, **Greater Bombay** (= Mumbai), one, August 1983 (Bannerjee 1984).

■ **Bihar** Published records are from the Ganges area northwards: **Jaynagar**, undated (Inglis 1901–1904); **Narhar**, undated (Inglis 1901–1904); **Darbhanga district**, Tirhut, undated (Dalgleish 1902), also unspecified localities in Tirhut, undated (Abdulali 1968–1996) and Baghownie, undated (Inglis 1901–1904), breeding in January 1901 (eggs in MM), March 1907 (specimen in BNHS), November 1914 (specimen in MM); **Chupra** (“Lowa Chupra”), December 1899 (specimen in BNHS, Abdulali 1968–1996); Siripur, **Saran**, November 1913 (specimen in BNHS, Abdulali 1968–1996); **Patna**, December 1936, February 1937 and February 1938 (three females in BMNH), with a pair nesting “for years” on the outskirts of the city, undated (E. A. D’Abreu in Whistler ms); Udhuwa lake, 11 km south-east of **Rajmahal** singles, 1994 and January 1996 (A. Mishra *in litt.* 2000); **Mohammadganj**, September 1947 (specimen in FMNH); Husainee (untraced), on the Gundall river, winter, c.1928 (Munns 1928).

■ **Orissa** The species is broadly mapped for the state by Grimmett *et al.* (1998) but scarcely any records have been traced. It appears in a preliminary list of species at Bhitarkanika Wildlife Sanctuary (Kar 1991), but not in a subsequent fuller treatment of the site (Pandav 1996), and this record is therefore treated as unconfirmed. An early publication mentions the species breeding on rocky islets at **Chilka lake**, undated (“Vagrant” 1868), although this behaviour seems anomalous. However, it was more recently mentioned for the site by Hussain *et al.* (1984) and it is probably a rare visitor there.

■ **West Bengal** Records are from: Sungma, **Rungbong valley**, 1,350 m, male, June 1919 (Stevens 1923–1925); **Kurseong**, July 1907 (specimen in BNHS, Abdulali 1968–1996); **Jaldapara Wildlife Sanctuary**, one, March 1991 (Samant *et al.* 1995), 1997 (Kumar 1998); **Jalpaiguri district**, “common”, 1910–1920 (Inglis *et al.* 1920); **Barddhaman** (Bardwan), undated (Ball 1878); near **Calcutta**, 1841–1843 (Blyth 1843–1844), and at Brace bridge, 1–2, October 1977 (Inskipp and Inskipp 1977); **Salt lakes**, near Calcutta, common, conspicuous and breeding, October–April, years unspecified (Biswas 1960–1966), undated (Anon. 1969b), one, October 1977 (Inskipp and Inskipp 1977); **Sundarbans National Park**, around cultivated tracts, undated (Mukherjee 1975); Sikkim terai (= present-day West Bengal), December 1872 (specimen in BMNH).

■ **Sikkim** There is a single record from the **Lachen valley** at c.2,750 m, of one adult presumably migrating northward to Tibet, April 1955 (Ali 1962).

■ **Arunachal Pradesh** There are two records: **Tezu**, December 1946 (Ali and Ripley 1948); **Bomdila**, January 1906 (specimen in BMNH).

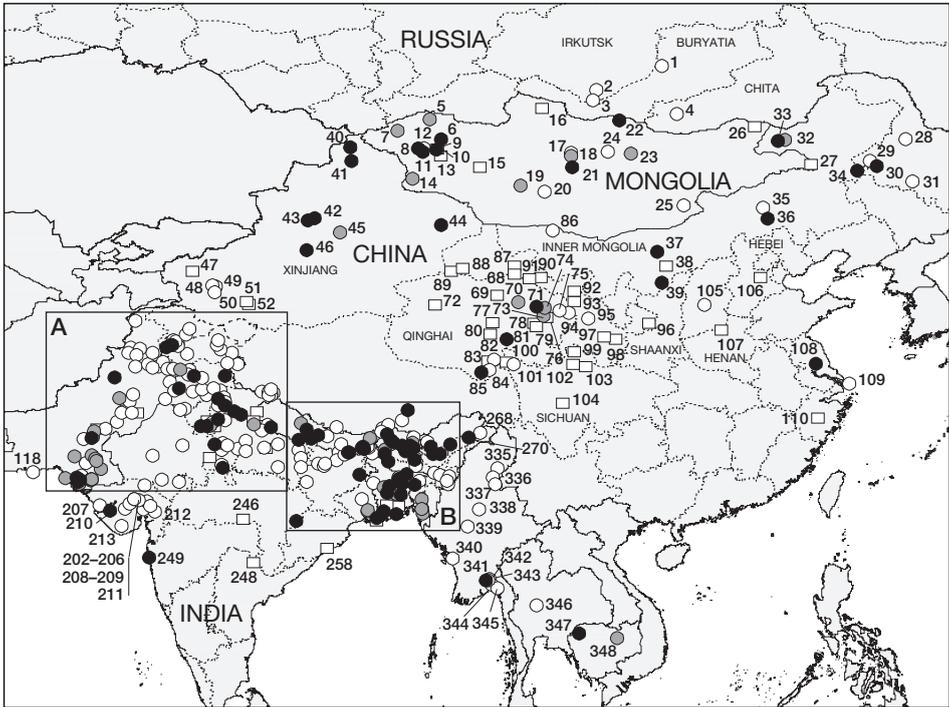
■ **Assam** The species was once very common in the Brahmaputra valley, and remains locally fairly common in this area, with records as follows (see Remarks 8): **Dibru-Saikhowa National Park**, Kathgora beel, regular in 1990s, including one, September 1993, one at Dadhia, October 1993 (Choudhury 1995c), December 1995 (Datta 1996), see also Sarmah (1996) and Choudhury (2000c); **Panidihing Sanctuary**, Sibsagar district, at Milonkur, one, July 1987 (Choudhury 1991), and elsewhere in Sibsagar district at Phokolai beel, regular, 1990s

(Choudhury 2000c); **Nameri National Park**, “common”, 1995–1997 (Talukdar and Das 1997), up to four daily, March 1998 (H. Hendriks *in litt.* 1999); **Manas National Park**, 1–2, February 1980 (G. M. B. Sparks *in litt.* 2000), 1987 (Rahmani *et al.* 1988; also Anon. 1990b), 1990s (Choudhury 2000c); c.15 km west of **Kohora**, adult, February 1998 (Hornbuckle 1998b); **Kaziranga National Park**, April 1971 (Aarestrup *et al.* 1971), six adults and three immatures, March 1981 (Krabbe 1981), 10 sightings in 14 days, April–May 1991 (Samant *et al.* 1995), at least five at Sohola (Sohala), December 1993 (J.-C. Kovacs *in litt.* 1998), up to c.10 in a day, February 1994 (Alström *et al.* 1994b), nine nests found, 1995–1996 (Barua and Sharma 1999), 6–8 (including fully fledged young), March 1998 (Hornbuckle 1998b, H. Hendriks *in litt.* 1999); **Deepor beel**, three, February 1994 (Alström *et al.* 1994b; also Choudhury 2000c); Kamrup district (previously including present-day Barpeta and Nalbari districts), at unspecified localities, December 1876 (specimen in BMNH), March 1881 (specimen in BMNH), and at **Palasbari**, November–December 1949 (six in UMMZ), and more recently at Ketekijhar and Hajo, October 1986 (Choudhury 2000c); **Cachar**, undated (Baker 1894–1901); **Dilkhushah**, female, undated (Hume 1880b); Bordoibam-Bilmukh Sanctuary (not mapped), Dhamaji/Lakhimpur district, 1990s (Choudhury 2000c); Botha beel (not mapped), Darrang district, 1990s (Choudhury 2000c); Burachapori Wildlife Sanctuary (not mapped), Sonitpur district, 1990s (Choudhury 2000c); Jaingdia beel (not mapped), 1990s (Choudhury 2000c); Jamjing Reserve Forest (not mapped), Dhemaji district, regular, 1990s (Choudhury 2000c); Kokrajhar district (not mapped), sporadic, 1990s (Choudhury 2000c); Kollolua (not mapped), Dibrugarh district, November 1993 (Choudhury 2000c); Lakhimpur district (not mapped), at Orne chapori, Bhakundoi beel and Pabho Reserve Forest, sporadic, 1990s (Choudhury 2000c); Laokhowa Wildlife Sanctuary (not mapped), regular and breeding, 1990s (Choudhury 2000c); Majuli area (not mapped), Jorhat district, regular, 1990s (Choudhury 2000c); Orang National Park (not mapped), regular, 1990s (Choudhury 2000c); Pobitora (Pabitora) Wildlife Sanctuary (not mapped), regular and breeding, 1990s (Choudhury 2000c); Dipdepibil (untraced), “Koru”, January 1906 (specimen in BMNH); Kornabada (untraced), January 1906 (two females in AMNH).

■ **Meghalaya** There is a single record: **Khasia hills**, undated (Baker 1907b).

■ **Manipur** Records, all at least 120 years old, are from: **Imphal** (“Imphal Turail”), pre-1881 (Hume 1888); **Logtak lake**, several pairs, March 1881 (specimen in BMNH, Hume 1888) and Logtak canal, March 1881 (specimen in BMNH); **Sugnu** (Soognoo), March 1881 (specimen in BMNH).

■ **NEPAL** The species occurs from Sukila Phanta Wildlife Reserve in the west to Hans Pokhari Danda in the east. In recent decades, one or two individuals were resident at Royal Sukla Phanta Wildlife Reserve (Schaff *et al.* 1980), although it is now only a scarce and irregular visitor there, and elsewhere in the country. Records are from: **Mahakali**, at “Jolgibi”, Darchula, three, undated (van Riessen 1986); **Royal Sukla Phanta Wildlife Reserve**, undated (Schaff *et al.* 1980); in the Upper Kali Gandaki valley, seven at **Tukche**, September–October 1973 (Beaman 1973); **Bilauri**, around 1950 (Rand and Fleming 1957); **Tikapur**, female, December 1948 (Ripley 1950b, 1953); **Royal Bardia National Park**, on the Karnali river, two, January 1992 (Halliday and Baral 1992); **Pokhara**, May 1981 (Krabbe 1981), one immature at the lakeside, March 1995 (P. Schiermacker-Hansen *in litt.* 1999) and Pokhara–Tatopani, one, April 1980 (Madsen and Poulsen 1980); **Trisuli river**, Kathmandu–Pokhara, two, December 1981 (Hamon 1981); **Kathmandu valley**, undated records (Hodgson 1836, Scully 1879); **Royal Chitwan National Park**, October–April (possibly September–May), at subsites including Machan and the Narayani river, unspecified years (Gurung 1983, Anon. 1988b, H. S. Baral *in litt.* 1991, 1996), also one at Meghauli, January 1982 (Bensch 1982), an adult at Gaida Wildlife Camp, September 1988 (H. S. Baral verbally 1997), and one c.3.2 km west of Sauraha, May 1993 (Roberts 1993); **Bhairahawa**, one near a fish-farm, June 1988 (Suwal and

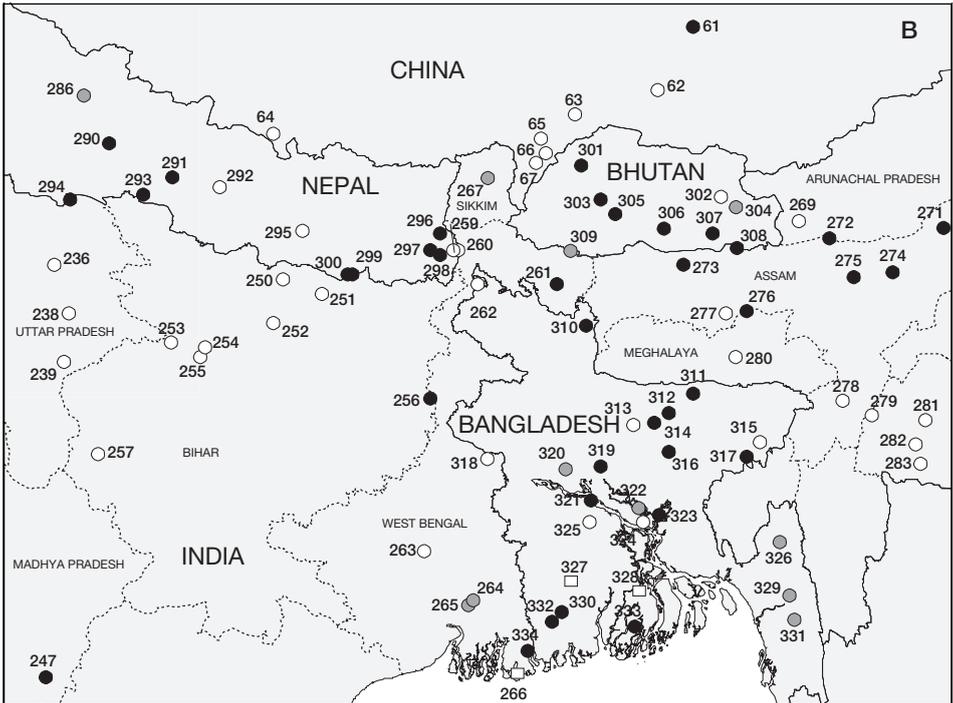
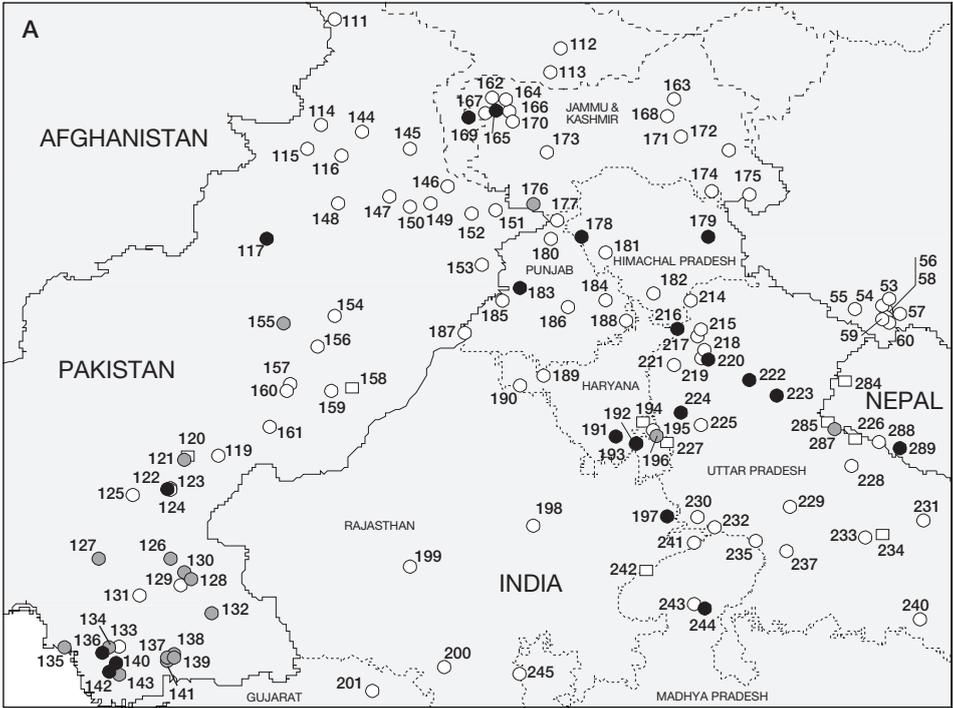


Shrestha 1989); **Ragunthanpur**, one female, January, late 1940s (Rand and Fleming 1957); **upper Mai valley**, one probable migrant, April 1986 (Heath 1986); **Ilam–Jamuna**, April 1986 (Heath 1986); **Hans Pokhari Danda**, one, April 1981 (Mills and Preston 1981); **Kosi Tappu Wildlife Reserve**, at Kushaha, first-year bird between December 1992 and January 1993 (Nielsen 1993), one, February 1995 (Wheeldon 1995), and on the Kosi river, one, January 1995 (Giri 1995); **Kosi barrage**, 1–2, February–April 1981 (Inskipp and Inskipp 1981a, Porter *et al.* 1981, del Nevo and Ewins 1981, Mills and Preston 1981), two, April 1983 (Alström and Olsson 1983, Byers and Adams 1983), two, February 1984 (Hornskov 1984), one, March–May 1986 (Dymond 1986, Heath 1986, Mayer 1986), one, March 1987 (Turin *et al.* 1987, Bose *et al.* 1989), four, May 1988 (Kall and Wallander 1988), one, March 1991 (H. S. Baral *in litt.* 1996), and March 1992 (Bräunlich and Oehlschlaeger 1993), two, December 1992 (Nielsen 1993).

■ **BHUTAN** A few pairs occupy traditional territories along major rivers and these account for the majority of recent sightings. Records are from: **Gasa** (Ghasa), Jigme Dorji National Park, 2,800 m, one, presumably on passage, April 1996 (Inskipp and Inskipp 1996); between Tashigang (Trashigang) and **Tashi Yangtse** (Trashiyangsi), on the Manas river, “occasionally seen”, with breeding recorded at 1,850 m, c.5 km above Tashi Yangtse on the banks of the “Trashiyangsi Chu”, September 1934 (Ludlow and Kinnear 1937, Ludlow ms); between Tashitang and **Wangdi** (Wangdue Phodrang) on the Mo Chu, several records probably referring to one pair and their offspring (C. Inskipp *in litt.* 2000), including one at Wangdi, March 1993 (Johnson 1993), one near Punakha, 1,300 m, November 1993 (Inskipp and Inskipp 1993a), and two adults there, March 1995 (Bishop 1999), two immatures at Tashitang, March 1994, and an adult and immature there, March 1996 (Bishop 1999), one at Rimchu, 1,300 m, May 1994 (Tymstra *et al.* 1996), one adult in the “Upper Mo Chu valley”, November 1994 (R. P. Martins *in litt.* 1994), one on the Sang Chu, west of Wangdi, March 1995 (Holt

The distribution of Pallas's Fish-eagle *Haliaeetus leucoryphus* (map opposite): (1) Baikal Lake; (2) Irkutsk; (3) Utulik; (4) Chikoy river; (5) Uvs Nuur; (6) Ayrag Nuur; (7) Achit Nuur; (8) Buyant river; (9) Chono KharaiKh river; (10) Khar Nuur; (11) Khovd river; (12) Khar Us Nuur; (13) Döröd Nuur; (14) Bulgan; (15) Dzavkhan river; (16) Hövsögöl lake; (17) Tamir river; (18) Ögiy Nuur; (19) Boon Tsagaan Nur; (20) Orog Nuur; (21) Khujirt; (22) Orkhon river; (23) Ulaanbaatar; (24) Tola river; (25) Bayan Bogdo; (26) Mongol Daguur Strictly Protected Area; (27) Numrug Strictly Protected Area; (28) Wudalianchi city; (29) Hulan Ergi; (30) Zhalong National Nature Reserve; (31) Harbin; (32) Lamagulusu; (33) Dalai Hu National Nature Reserve; (34) Jalaid Qi; (35) Xilin Gol; (36) Dalai Nur Nature Reserve; (37) Ulansuhai Nur; (38) Taolimiao-Alashan Nur; (39) Ordos Desert; (40) Chardingji; (41) Ulungur Hu; (42) Nalatie; (43) Bayanbulak; (44) Hami; (45) Hejing county; (46) Tarim basin; (47) Kashi; (48) Shache county; (49) Igachi; (50) Yecheng; (51) Moyu county; (52) Hotan district; (53) Zunthulphuk; (54) Lha Chhu; (55) Gyanyima Tso; (56) Chiu Gompa; (57) Ding Tso; (58) Gossul Gompa; (59) Rakas Tal; (60) Ngayeze; (61) Lhasa; (62) Yamdrok Tso; (63) Nyang-chu; (64) Changdong; (65) Kala Tso; (66) Bam Tso; (67) Tuna; (68) Qilian Shan; (69) Gurab Angir Gol; (70) Tianjun county; (71) Qinghai Hu; (72) Qaidam basin; (73) Haiyan county; (74) Xining; (75) Gonghe county; (76) Kung-ho-ku-chih; (77) Burchan Buddha Ula; (78) Chasora river; (79) Tsurumun Chu; (80) Huang ho; (81) Jiang Cuo; (82) Camp 71; (83) Yushu county; (84) Camp 91; (85) Nanqian; (86) Sogo Nur; (87) Jiuguang county; (88) Subei county; (89) Aksay county; (90) Zhangye county; (91) Sunan county; (92) Wuwei county; (93) Tianzhu county; (94) Nienpaihsien; (95) Lanzhou; (96) Heshui county; (97) Wushan county; (98) Tianshui city; (99) Zoigê; (100) Serxu county; (101) Camp 139; (102) Hongyuan county; (103) Songpan county; (104) Garzê prefecture; (105) Shanxi; (106) Hebei; (107) Jiaozuo; (108) Jianguo; (109) Shawaishan island; (110) Zhejiang; (111) Chitral; (112) Baltistan; (113) Deosai plains; (114) Peshawar; (115) Chikarkot; (116) Khushalgarh; (117) Dera Ismail Khan district; (118) Ormara; (119) Bori; (120) Kandhkot; (121) Ghauspur; (122) Sukkur; (123) Eastern Narra; (124) Rohri; (125) Larkana; (126) Jamrao head; (127) Manchar lake; (128) Sadori lake; (129) Sangriar; (130) Sunari lake; (131) Hala; (132) Dhoro Naro; (133) Kinjar lake; (134) Chatteji lake; (135) Karachi; (136) Haleji lake; (137) Charwo lake; (138) Dabhko lake; (139) Phoosani lake; (140) Sujawal bridge; (141) Badin; (142) Thatta district; (143) Mahboub Shah lake; (144) Attock; (145) Rawalpindi; (146) Jhelum; (147) Kallar Kahar lake; (148) Nammal; (149) Punjab salt range; (150) Pind Dadan Khan; (151) Sialkot; (152) Wazirabad; (153) Lahore; (154) Ahmadpur Sial; (155) Taunsa barrage; (156) Multan; (157) Hamzewali; (158) Lal Suhanra National Park; (159) Bahawalpur; (160) Alipur; (161) Jajjah-Abbasian; (162) Wular lake; (163) Tirit; (164) Bandipur; (165) Haigam Rakh; (166) Gandarbal; (167) Baramula; (168) Leh; (169) Hokersar; (170) Srinagar; (171) Upshi; (172) Chushul; (173) Marbul pass; (174) Tso-Moriri lake; (175) Hanle; (176) Samba; (177) Madhopur; (178) Pong Dam lake; (179) Spiti; (180) Chakki Khad; (181) Sujanpur; (182) Theog; (183) Harike Lake Wildlife Sanctuary; (184) Rupa; (185) Firozpur; (186) Ludhiana district; (187) Fazilka; (188) Mubarakpur; (189) Bhattu; (190) Sirsa; (191) Bhindawas Wildlife Sanctuary; (192) Sultanpur National Park; (193) Garhi Harsaru; (194) Bawana; (195) Delhi; (196) Okhla; (197) Keoladeo National Park; (198) Sambhar lake; (199) Jodhpur; (200) Udaipur; (201) Palanpur; (202) Kharaghoda; (203) Nal lake; (204) Viramgam; (205) Ahmedabad; (206) Baoli; (207) Mandvi; (208) Kaira district; (209) Than; (210) Jamnagar; (211) Golana; (212) Vadodara; (213) Vekaria; (214) Tiuni; (215) Mussoorie; (216) Asan barrage; (217) Dehra Dun; (218) Kansrao; (219) Hardwar; (220) Rajaji National Park; (221) Saharanpur; (222) Corbett National Park; (223) Kaladhungi; (224) Meerut; (225) Garhmuktesar; (226) Dudwa National Park; (227) Hindan river; (228) Kheri district; (229) Fatehgarh; (230) Agra; (231) Gonda; (232) Fatehabad; (233) Lucknow; (234) Nawabganj Priyadarshani Sanctuary; (235) Etawah; (236) Gorakhpur; (237) Jheenjuck jheel; (238) Ghosi; (239) Mainpur; (240) Allahabad; (241) Dholpur; (242) National Chambal Sanctuary; (243) Narwar; (244) Karera Bustard Sanctuary; (245) Nimach; (246) Pench National Park; (247) Chandarpur; (248) Indravati river; (249) Greater Bombay; (250) Jaynagar; (251) Narhar; (252) Darbhanga district; (253) Chupra; (254) Saran; (255) Patna; (256) Rajmahal; (257) Mohammadganj; (258) Chilka lake; (259) Rungbong valley; (260) Kurseong; (261) Jaldapara Wildlife Sanctuary; (262) Jalpaiguri district; (263) Bardhaman; (264) Calcutta; (265) Salt lakes; (266) Sundarbans National Park; (267) Lachen; (268) Tezu; (269) Bomdila; (270) Dibru-Saikhowa National Park; (271) Panidihing Sanctuary; (272) Nameri National Park; (273) Manas National Park; (274) Kohora; (275) Kaziranga National Park; (276) Deepor beel; (277) Palasbari; (278) Cachar; (279) Dilkhushah; (280) Khasia hills; (281) Imphal; (282) Logtak lake; (283) Sugnu; (284) Mahakali; (285) Royal Sukla Phanta Wildlife Reserve; (286) Tukche; (287) Bilauri; (288) Tikapur; (289) Royal Bardia National Park; (290) Pokhara; (291) Trisuli river; (292) Kathmandu valley; (293) Royal Chitwan National Park; (294) Bhairahawa; (295) Ragnunthanpur; (296) upper Mai valley; (297) Ilam; (298) Hans Pokhari Danda; (299) Kosi Tappu Wildlife Reserve; (300) Kosi barrage; (301) Gasa; (302) Tashi Yangtse; (303) Wangdi; (304) Tashigang; (305) Ada lake; (306) Tingtibi; (307) Dangme Chu; (308) Manas river; (309) Wong Chu; (310) Nageswari; (311) Tangua haor; (312) Netrakona; (313) Mymensingh; (314) Pashua haor; (315) Sylhet; (316) Kishorganj; (317) Hail haor; (318) Rajshahi; (319) Tangail; (320) Pabna district; (321) Aricha; (322) Dhaka; (323) Sonargaon; (324) Narayanganj; (325) Faridpur; (326) Pablakhal; (327) Khulna district; (328) Barisal district; (329) Rangamati; (330) Sutarkhali; (331) Kaptai; (332) Kasiabad; (333) Patuakhali; (334) Sundarbans; (335) Myitkyina; (336) Sinbo; (337) Bhamo district; (338) Nyaungwun; (339) Myingyan district; (340) Arakan; (341) Mogyingye Wetland Sanctuary; (342) Abya; (343) Waw; (344) Sittang river; (345) Thaton; (346) Thailand; (347) Ang Trapeang Thmor Reserve; (348) Stung Treng.

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



1995), two at Wangdi dzong (at the edge of Wangdi town), 1,000 m, December 1995 (R. Pradhan *in litt.* 1998), two adults at Bajothang, on the Sang Chu, April 1999 (P. Holt *in litt.* 1999), and beside the Puna Tsang Chu, north of Wangdi, two adults, April 1999 (B. Carrick *in litt.* 1999), and January 2000 (C. Inskipp *in litt.* 2000); on the Manas river near its confluence with the Gamri Chu, presumably near **Tashigang** (Trashigang), one, December 1973 (Ali *et al.* 1996), and one on the Gamri Chu, 1934 (Ludlow ms), also one over Rolong, 9 km from Tashigang dzong, May 2000 (*Oriental Bird Club Bull.* 32 [2000]: 66–76); **Ada lake**, 1,000 m, one, February 1996 (R. Pradhan *in litt.* 1998); on a ridge near **Tingtibi**, and c.1 km from the Mande Chu, a nest with two fully grown young at 1,000 m, April 2000 (D. Farrow *per* C. Inskipp *in litt.* 2000); Zarkapla (over the **Dangme Chu**), 300 m, one, December 1993 (R. Pradhan *in litt.* 1998); on the **Manas river**, one, 250 m, April 1993 (Inskipp and Inskipp 1993b), one, December 1993 (R. Pradhan *in litt.* 1998); near Khairbani, on the **Wong Chu**, one, March 1969 (Ali *et al.* 1996); Metshina (untraced), two, October 1995 (J.-C. Kovacs *in litt.* 1998).

■ **BANGLADESH** Although Pallas's Fish-eagle is listed as a widespread resident throughout the country (Rashid 1967; but see Remarks 2 under Manipur Bush-quail *Perdicula*

The distribution of Pallas's Fish-eagle *Haliaeetus leucoryphus* (map A opposite): (53) Zunthulphuk; (54) Lha Chhu; (55) Gyanyima Tso; (56) Chiu Gompa; (57) Ding Tso; (58) Gossul Gompa; (59) Rakas Tal; (60) Ngayeze; (111) Chitral; (112) Baltistan; (113) Deosai plains; (114) Peshawar; (115) Chikarkot; (116) Khushalgarh; (117) Dera Ismail Khan district; (118) Ormara; (119) Bori; (120) Kandhkot; (121) Ghauspur; (122) Sukkur; (123) Eastern Narra; (124) Rohri; (125) Larkana; (126) Jamrao head; (127) Manchar lake; (128) Sadori lake; (129) Sangriaro; (130) Sunari lake; (131) Hala; (132) Dhoro Naro; (133) Khinjar lake; (134) Chatteji lake; (135) Karachi; (136) Haleji lake; (137) Charwo lake; (138) Dabhko lake; (139) Phoosani lake; (140) Sujawal bridge; (141) Badin; (142) Thatta district; (143) Mahboub Shah lake; (144) Attock; (145) Rawalpindi; (146) Jhelum; (147) Kallar Kahar lake; (148) Nammal; (149) Punjab salt range; (150) Pind Dadan Khan; (151) Sialkot; (152) Wazirabad; (153) Lahore; (154) Ahmadpur Sial; (155) Taunsa barrage; (156) Multan; (157) Hamzewali; (158) Lal Suhanra National Park; (159) Bahawalpur; (160) Alipur; (161) Jajjah-Abbasian; (162) Wular lake; (163) Tirit; (164) Bandipur; (165) Haigam Rakh; (166) Gandarbal; (167) Baramula; (168) Leh; (169) Hokarsar; (170) Srinagar; (171) Upshi; (172) Chushul; (173) Marbul pass; (174) Tso-Moriri lake; (175) Hanle; (176) Samba; (177) Madhopur; (178) Pong Dam lake; (179) Spiti; (180) Chakki Khad; (181) Sujapur; (182) Theog; (183) Harike Lake Wildlife Sanctuary; (184) Rupa; (185) Firozpur; (186) Ludhiana district; (187) Fazilka; (188) Mubarakpur; (189) Bhattu; (190) Sirsa; (191) Bhindawas Wildlife Sanctuary; (192) Sultanpur National Park; (193) Garhi Harsaru; (194) Bawana; (195) Delhi; (196) Okhla; (197) Keoladeo National Park; (198) Sambhar lake; (199) Jodhpur; (200) Udaipur; (201) Palanpur; (214) Tiuni; (215) Mussoorie; (216) Asan barrage; (217) Dehra Dun; (218) Kansrao; (219) Hardwar; (220) Rajaji National Park; (221) Saharanpur; (222) Corbett National Park; (223) Kaladhungi; (224) Meerut; (225) Garhmuktesar; (226) Dudwa National Park; (227) Hindan river; (228) Kheri district; (229) Fatehgarh; (230) Agra; (231) Gonda; (232) Fatehabad; (233) Lucknow; (234) Nawabganj Priyadarshani Sanctuary; (235) Etawah; (237) Jheenjuck iheel; (240) Allahabad; (241) Dholpur; (242) National Chambal Sanctuary; (243) Narwar; (244) Karera Bustard Sanctuary; (245) Nimach; (284) Mahakali; (285) Royal Sukla Phanta Wildlife Reserve; (288) Tikapur; (289) Royal Bardia National Park.

(map B opposite): (61) Lhasa; (62) Yamdrok Tso; (63) Nyang-chu; (64) Changdong; (65) Kala Tso; (66) Bam Tso; (67) Tuna; (236) Gorakhpur; (238) Ghosi; (239) Mainpur; (247) Chandarpur; (250) Jaynagar; (251) Narhar; (252) Darbhanga district; (253) Chupra; (254) Saran; (255) Patna; (256) Rajmahal; (257) Mohammadganj; (259) Rungbong valley; (260) Kurseong; (261) Jalapara Wildlife Sanctuary; (262) Jalpaiguri district; (263) Bardhaman; (264) Calcutta; (265) Salt lakes; (266) Sundarbans National Park; (267) Lachen; (269) Bomdila; (271) Panidihing Sanctuary; (272) Nameri National Park; (273) Manas National Park; (274) Kohora; (275) Kaziranga National Park; (276) Deepor beel; (277) Palasbari; (278) Cachar; (279) Dilkhushah; (280) Khasia hills; (281) Imphal; (282) Logtak lake; (283) Sugnu; (286) Tukche; (290) Pokhara; (291) Trisuli river; (292) Kathmandu valley; (293) Royal Chitwan National Park; (294) Bhairahawa; (295) Ragunthanpur; (296) upper Mai valley; (297) Ilam; (298) Hans Pokhari Danda; (299) Kosi Tappu Wildlife Reserve; (300) Kosi barrage; (301) Gasa; (302) Tashi Yangtse; (303) Wangdi; (304) Tashigang; (305) Ada lake; (306) Tingtibi; (307) Dangme Chu; (308) Manas river; (309) Wong Chu; (310) Nageswari; (311) Tangua haor; (312) Netrakona; (313) Mymensingh; (314) Pashua haor; (315) Sylhet; (316) Kishorganj; (317) Hail haor; (318) Rajshahi; (319) Tangail; (320) Pabna district; (321) Aricha; (322) Dhaka; (323) Sonargaon; (324) Narayanganj; (325) Faridpur; (326) Pablaikhali; (327) Khulna district; (328) Barisal district; (329) Rangamati; (330) Sutarkhali; (331) Kaptai; (332) Kasiabad; (333) Patuakhali; (334) Sundarbans.

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

manipurensis), it is uncommon and declining (Khan 1982) with most records from the north-east, along major rivers and in the Sundarbans. Records are from: **Nageswari**, Pabna, on the Jamuna, one, January 1996 (P. M. Thompson *in litt.* 2000); **Tangua haor**, nesting, 1990s (Thompson and Johnson 1996), eight adults and five immatures, 1992–1993 (S. M. A. Rashid *in litt.* 1994); **Netrakona**, 1990s (P. M. Thompson *in litt.* 2000); **Mymensingh**, breeding in December and January, year unspecified (Godwin-Austen 1870); **Pashua haor** (Pashua beel), two adults and 17 immatures, 1992–1993 (S. M. A. Rashid *in litt.* 1994); **Sylhet**, common, undated (Baker 1894–1901); **Kishorganj**, recorded recently (P. M. Thompson *in litt.* 2000); **Hail haor**, resident, 1990s (Thompson and Johnson 1996); **Rajshahi** (as “Raj Shai”), November 1882 (BMNH egg data), and (as “Rajhahye, nord Bengal et nord Gange”), December 1882 (two eggs in IRSNB); **Tangail**, a pair, mid-1990s (P. M. Thompson *in litt.* 2000); Kochiar beel, **Pabna district**, pair nesting, December c.1970 (Husain and Sarker 1971; also Sarker 1987c); Alachipur, near **Aricha**, c.85 km west of Dhaka, an active nest, 1981–1983 (Sarker and Iqbal 1985); **Dhaka** (Dacca), “common” resident, undated but presumably historical (Husain *et al.* 1974), December 1869 (BMNH egg data), between 1968 and 1974 (Sarker 1987c); **Sonargaon**, adult, January 1983 (Suter 1983); **Narayanganj** (Naryan Gunj), where the Lukhia river joins the Meghna river, one, 1870s (Cripps 1878); **Faridpur** (Furreedpore), “common”, 1870s (Cripps 1878); **Pablakhali**, one, November 1966 (Mountfort and Poore 1968); **Khulna district**, undated (Khan 1983b); **Barisal district**, undated (Khan 1983b); between **Rangamati** and Pablakhali, five, November 1966 (Mountfort and Poore 1968); **Sutarkhali**, Sundarbans, pair, March 1981 (Sarker 1985, 1986b, Sarker and Sarker 1985a); **Kaptai** (Kaptai or Karnafuli reservoir), one, November 1966 (Mountfort and Poore 1968); **Kasiabad**, Khulna range, pair, 1981–1983 (Sarker 1985, 1986b, Sarker and Sarker 1985a); **Patuakhali** (see Remarks 9), apparently common, 1982–1986 (Hari 1989); **Sundarbans** (see Remarks 9), collected at Burigoalni, June and September 1958 (two specimens in YPM), unspecified numbers, January–April 1971 (Hendrichs 1975), common, undated (Habib 1989), at Mongla, Heron point and Dubla island, December 1986 and November 1987 (N. P. van Zalinge *in litt.* 1989).

An unconfirmed record is from Jessore, involving “a few believed to be present, but not proved beyond doubt”, 1943–1944 (Lister 1951).

■ **MYANMAR** The species was once “the common fishing eagle of the Irrawaddy” (Smythies 1986), but there have been few recent sightings. Records are as follows: between **Myitkyina** and the “First Defile” on the Irrawaddy (= Ayeyarwady), 6–7 pairs breeding, 1930s (Stanford and Ticehurst 1938–1939); **Sinbo** (Hsenbo), January 1936 (specimen in BMNH); **Bhamo district**, undated (Oates 1888), breeding (Harington 1909–1910; also Stanford and Ticehurst 1938–1939); **Nyaungwun**, east of Tongyi on the Irrawaddy, Mandalay district, where a pair was nesting beside the road in open country, February 1935 (Smith 1942); **Myingyan district**, “along the river”, around 1900–1905 (Macdonald 1906); **Arakan**, where listed as common and breeding, c.1910 (Hopwood 1912b); **Mohingyi Wetland Sanctuary**, one immature, December 1994 (*Oriental Bird Club Bull.* 21 [1995]: 68–73); **Abya**, Sittang river, November 1875 (BMNH egg data); **Waw**, December 1875 (BMNH egg data); **Sittang river**, December 1872 (specimen in BMNH); **Thaton** (Thatone), August 1875 (specimen in BMNH), February 1878 (specimen in BMNH).

■ **THAILAND** Given records as far south as Thaton in Myanmar, it is likely that the species once ventured into Thailand, at least as a straggler. There is, however, only one record from “Siam”, pre-1955 (specimen in BMNH) and a recent unconfirmed record from Doi Ang Khang, November 1999 (*Bird Conserv. Soc. Thailand Bull.* 17, 1 [2000]: 14).

■ **CAMBODIA** Although the species seems unlikely to occur in Cambodia on a “range and habitat basis” (C. M. Poole *in litt.* 1999), the existence of historical records from Thailand

and southern Myanmar suggests that occasional visits are to be expected, and there is a very recent record from the north-east to support this notion. Records are from: **Ang Trapeang Thmor Reserve**, one subadult, June 2000 (*Oriental Bird Club Bull.* 32 [2000]: 66–76); **Stung Treng**, an individual apparently captured nearby during the 1960–1961 winter (Thomas 1964); unknown location, 1875 (Oustalet 1899).

POPULATION During the course of the twentieth century, Pallas's Fish-eagle declined gradually in the western fringes of its range. It last bred on the Caspian Sea in 1947, the population that regularly summered on the Volga–Ural steppes (Russia/Kazakhstan) has disappeared and it now occurs there and further west as a vagrant only (Cramp and Simmons 1980). In Kazakhstan, gatherings of up to 20–30 birds were not uncommon on the Caspian and Aral Seas, on the Syrdar'ya river and in the Ili river delta in the 1930s–1950s; the situation changed completely after 1960, with only c.50 records, possibly even fewer if misidentifications are taken into account, in the period 1970–1995, and the species is now very rare and probably close to extinction in the country, with an estimated population of under 100 and probably fewer than 50 individuals (A. Kovshar *per* A. Bräunlich *in litt.* 2000).

Russia Eastern Russia Sushkin (1938) recorded numerous adults and two fledglings on the Ukok plateau (south-east Altay) in the early twentieth century, but there were no subsequent authenticated breeding records in the area, although adults continued to be seen there (Kuchin 1981). The species apparently bred in south-west Transbaykalia in the late nineteenth–early twentieth centuries (see Remarks 10). Summer records of adult and young Pallas's Fish-eagles (five birds in 1979, four in 1980, and two in 1982) in south Pribaykal'ye (Tunkinskaya valley of the Irkut river) suggested that the species might still be breeding south-west of Baikal lake, although these records may result from post-breeding dispersal from Mongolia (Galushin 1983, Dorzhiev 1988).

Mongolia Although in the mid-nineteenth century it was described as “very rare, seen several times along rivers in Mongolia” (David 1867), it was later (in the 1920s) considered a “fairly common” breeding bird in the north of the country (Kozlova 1932–1933). Although Sushkin (1938) considered it much scarcer than the congeneric White-tailed Eagle *Haliaeetus albicilla* in north-west Mongolia, this no longer appears to be the case as it was recently encountered quite commonly at almost every lake and at “the Bulgan” (presumably Bulgan river), while White-tailed Eagle was apparently absent (Piechocki 1968). An important but unquantified population is thus present, at least seasonally, in the country.

China The species was evidently “quite common and plentiful” near lakes in the Kangrinboqê Feng–Mapam Yumco (= Kailas–Manasarowar) region of western Tibet in 1945, where more than 20 were counted in one 8 ha area and 15 in another small bog (Ali 1946). It was also “fairly common” at the Parkha plain in July 1954 (Lavkumar 1955). An important summering population visits southern Tibet, where it was “common” at Yam Dok Cho and other large lakes in 1904, and seen “in moderate numbers” at Tuna in January–April 1904 (Walton 1906), seen “occasionally” near the rivers and marshes of the plateau in the 1920s (Hingston 1927), “abundant” at Bam Tso (= Hram Tso) and Gala Co (= Kala Tso) lakes in spring and summer in the mid-1920s, “common” in 1946 (Ludlow 1927–1928, Maclaren 1947b, 1948) and “not uncommon” on the Nyang-chu river in spring c.1925 (Ludlow 1927–1928). It was “often seen” around Lhasa in August–September 1904 (Walton 1906) and still described as “not uncommon” there in 1942 (Ludlow 1950). At Qinghai Hu (= Koko Nor) in Qinghai province, there was “a good breeding population” (Scott 1989). It is judged to be declining in China (Gao Wei *in litt.* 1997); for example, only a single bird was seen during a visit to the Lhasa area and the Yarlung Tsangpo valley in June 1997 (R. M. Thewlis *in litt.* 1999) where it was thought to be numerous in the past. In Inner Mongolia it was recently described as “rare now” at Wuliangshuai (= Ulansuhai Nur) (Xing Lianlian *et al.* undated), indicating that there has been a decline in its numbers there.

Pakistan After his journey through Punjab and Sind, Hume (1872–1873) concluded that the species was “very common all down the great rivers from Jhelum to Sukkur”, with “a few birds between Sehwan and Hyderabad” and “one, two, or even more pairs” on each of the larger lakes in the region; at Manchar lake he found “several of their nests”. Dense populations of the species apparently bred along the lengths of the Indus, Chenab, Jhelum and Sutlej rivers (Hume and Oates 1889–1890). Early in the twentieth century, Whistler (1913) also found eyries scattered along the Jhelum river “at intervals of a few miles” (see also Whistler and Ticehurst 1916). In Jhang district, pairs of the species occurred “throughout the whole extent of the riverain area”, i.e. along the Jhelum and Chenab rivers (Whistler 1922a). It was also “very common” in Sind, where it was far more numerous than in neighbouring Gujarat in India (Barnes 1885, 1888–1891). Indeed, according to Ticehurst (1922–1924), “every jheel of any size contains a pair or two” in Sind, and they were distributed fairly constantly along the Indus. During duck shoots in Sind the species was “always in attendance” to pick up any wounded waterfowl (Ticehurst 1922–1924). In the Punjab Salt Range, between 1918 and 1948, pairs nested at all lakes but one (Waite 1948).

While the picture drawn by early exploration suggests that many thousands of pairs visited the country to breed, the population has clearly undergone a steep decline. In North-West Frontier Province, the species was always relatively uncommon; it was recently “rare but regular” along the Indus in Dera Ismail Khan district, 1988–1998, with several sightings of young birds but only one of an adult (Kylänpää 2000). The scale of decline is more spectacular in the Punjab and Sind; in the latter it had by the 1960s become uncommon (Holmes and Wright 1968–1969), and more recently “very sparsely distributed” (Roberts 1991–1992). In contrast with their earlier abundance at the lakes of the Punjab Salt Range, they were only “occasionally sighted” in the area through the 1980s (Roberts 1991–1992). The greatest concentration of pairs probably occurs around Ghauspur jheel and Kandhkot in Jacobabad district, Sind, with about five pairs surviving within a 16 km radius in the 1980s; six individuals were recorded at Ghauspur jheel in the 1970s (Roberts 1991–1992). Further south, in Thatta district, four eyries were deserted in the late 1980s (Roberts 1991–1992), again indicating a rapid decline. The best quantification of the Pakistan population (and decline thereof) was provided by surveys in 1970–1974 of most major wetlands in the country; although this species was encountered on 77 occasions out of 442 large eagles sighted, this constituted only 26 breeding pairs (at 18 of 50 lakes visited) and the total Pakistan population was therefore estimated at fewer than 40 pairs (Koning and Dijkzen 1974, Koning 1976). Given subsequent declines (Roberts 1991–1992) the breeding population appears to be a tiny fraction of its pre-1900 levels.

India In the nineteenth century the species was manifestly “common” in its Indian range (Anderson 1872a). In northern India, for example, every lake known to Hume and Oates (1889–1890) that retained water until February held at least one breeding pair. Given the abundance of such wetlands in India, this species must have been a daily sight in many regions. Moreover, it apparently bred along the entire length of the Yamuna, Ganges and Chambal rivers with pairs being encountered “every 3 or 4 miles, and in particular localities every half mile!” (Hume and Oates 1889–1890). This exclamation of abundance now rings hollowly, as the species is generally hard to find and declining.

In nineteenth-century Kashmir, it was “abundant” at rivers and lakes (Adams 1859), “common everywhere in the valley of Kashmir along the Jhelum,” with “a pair ... every two or three miles along the river” (Davidson 1898b), and “abundant” around Wular lake (Richmond 1895). Around 30 years later, Osmaston (1927) described it as a “fairly common bird in the vicinity of lakes and jhils in the main valley of Kashmir”, and it was still “common” (Loke 1946), or “almost numerous” at Wular lake (Bates and Lowther 1952) midway through the twentieth century. In the Pong Dam reservoir area in Himachal Pradesh, it was locally common in Whistler’s (1926b) day, while in the Punjab it was “common” and “frequently

met with” on all large rivers and lakes (Donald 1918–1921). It was apparently widely, though sparingly, distributed in the northern plains of Gujarat (Brooks 1875a, Butler 1875–1877), where it was the commonest aquatic raptor (Inverarity 1886–1888). In the early 1930s, it was still “common” at Parwali and Ortu, Haryana (Koelz 1940). Around Delhi, it was “fairly common” on the Yamuna between 1931 and 1945 (Frome 1947–1948), while around Dehra Dun and Mussoorie, Uttar Pradesh, it was “extremely common”, skirting the outer hills (Hume and Oates 1889–1890). It was “a common and permanent resident” in Lucknow division, Uttar Pradesh (Jesse 1902–1903), where “a pair or two” was present at every wetland “of any pretensions” (Reid 1887). The same was said of Gorakhpur district, Uttar Pradesh, where Osmaston (1913) noted that “a pair of birds frequents nearly any lake of any size”. In Bihar, it was “fairly common” in Darbhanga district (Dalgleish 1902), “very common” around Baghownie (also Darbhanga district), but “rather scarce” around Jaynagar and Narhar (Inglis 1901–1904). In Jalpaiguri district of northern West Bengal it was also considered “common” (Inglis *et al.* 1920); in southern West Bengal it was also “not uncommon along the river” near Calcutta, 1841–1843 (Blyth 1843–1844). In the 1870s and early 1880s, Hume (1888) found it “common in the southern portion of the Manipur basin”, and “very common along the lower course of the Imphal Terail”. Large populations also then thrived along the Brahmaputra river in Assam, where the species was “common”, with nests “seen everywhere” (J. R. Cripps in Hume 1888). Almost 30 years later, Stevens (1914–1915) described it as “the common eagle on the banks of all the large rivers, the Bramapootra in particular, and on various large sheets of water ‘bhils’ throughout the plains” of Assam. It was scarce in north-eastern Cachar (Hume 1880b) and “not a common bird” in North Cachar Hills district, owing to the smallness of the rivers (Baker 1894–1901). Similarly, it only occasionally entered the Khasia hills of Meghalaya, “following the course of the larger streams” (Baker 1907b).

These early reports indicate that the species was once remarkably abundant for such a large raptor throughout much of northern India. Since then, alas, it has “become rare over most of its distribution” (Samant *et al.* 1995) and it begins the twenty-first century dramatically reduced in both range and numbers. After a visit to Kashmir in 1969, Gauntlett (1972) wrote, “I regret to say I never saw it and can only conclude that the increased disturbance has been too much for it and it occurs no longer, unless it holds on in some of the more secluded lakes”. Although few data have emerged from Kashmir recently, it is likely that the species survives only in much reduced numbers. In the 1990s, it remained fairly common at Pong Dam lake, Himachal Pradesh (Pandey 1993c). Although it once bred in some numbers in Gujarat and was previously a regular non-breeding migrant or visitor to Saurashtra (roughly = Kathiawar peninsula) (Dharmakumarsinhji 1955), it has apparently become a “great rarity” in the state (Khacher 1996). Further east, it is still “commonly observed” in Corbett National Park, Rajasthan (Lamba 1987). Also in Rajasthan, Keoladeo National Park is a regular site for the species; individuals were identified in the park on average every 7 km of transect in the 1980s (Prasad 1989) while in 1993 they were encountered every 14 km, suggesting a considerable decline (Samant *et al.* 1995), an impression certainly recounted by observers who have visited the park repeatedly over several years (B. F. King verbally 1998). Indeed, the well-known breeding pair apparently disappeared from the park around 1993/1994 (Loseby 1997), with only occasional birds recorded subsequently (see Distribution). In general, the large populations along major river systems and on the majority of lakes are no longer present, and while no population estimates are available, it is nevertheless clear that the overall decline has been severe.

As with several large waterbirds (e.g. Greater Adjutant *Leptoptilos dubius*, Lesser Adjutant *L. javanicus* and Spot-billed Pelican *Pelecanus philippensis*), Assam remains an important stronghold. The continuous population along the Brahmaputra appears to have become restricted to small stretches, but it is fairly common in several protected areas, including Dibru-Saikhowa National Park, Manas National Park, Laokhowa Wildlife Sanctuary,

Nameri National Park, Orang National Park, Panidihing Sanctuary and Pobitora Wildlife Sanctuary, occurring at nine protected areas in total and 40 separate localities in Assam (Talukdar and Das 1997, Choudhury 2000c). In the 1990s only three pairs were believed to survive in Kaziranga National Park, a population apparently “highly reduced” (Bhattacharjee *et al.* 1996), although nine nests were found in 1995–1996 (Barua and Sharma 1999), and encountering 10–15 “on any visit, especially in winter, is almost assured” (Choudhury 2000c). No population estimate for the state is available, although Choudhury (2000c) stated that Grey-headed Fish-eagles *Ichthyophaga ichthyaetus* were commoner than Pallas’s Fish-eagles, but numbered “less than 150 breeding pairs”.

Nepal The species was “not common in the valley” of Kathmandu, where it was seen mainly along the rivers or beside marshy ground and thought not to breed (Scully 1879); there were no records from this area in the twentieth century (Inskipp and Inskipp 1991). It was apparently “common and unsuspecting” in Nepal in the 1940s (Ripley 1950b). In the 1970s it was apparently resident in Royal Sukla Phanta Wildlife Reserve—although again no evidence of breeding was obtained (Schaff *et al.* 1980)—and a scarce winter visitor to Royal Chitwan National Park (Gurung 1983). Records from the Kosi river generally involve singles or pairs, although four birds together there (Kall and Wallander 1988) is the maximum recorded for Nepal (H. Choudhary verbally 1994). Currently, its population in winter has been estimated at under 30 birds (H. S. Baral *in litt.* 1997), although there might well be fewer than 10 (C. and T. P. Inskipp verbally 1998). It appears to be declining (H. S. Baral *in litt.* 1997).

Bhutan This species seems never to have been abundant in Bhutan, as it was observed only occasionally there in autumn by Ludlow and Kinnear (1937). A small breeding population survives: pairs were seen breeding in September 1934 (Ludlow ms), and more recently there have been records of a juvenile (Sherub *per* R. Pradhan *in litt.* 1998) and a nest (D. Farrow *per* C. Inskipp *in litt.* 2000), but overall numbers are probably very low.

Bangladesh Published accounts suggest that Pallas’s Fish-eagle was abundant along the major rivers of Bangladesh in the nineteenth century. Tytler (1854), for example, found it “very common” around the river Puddur between Barrackpur (West Bengal) and Dhaka. In Sylhet it was “rather more frequently met with” than in the adjoining region of Cachar, Assam (Baker 1894–1901), and indeed, J. Inglis described it as “extremely common in Sylhet” (in Hume 1880b). In Faridpur district, in the 1870s, the species was considered “much more common” than [Grey-headed Fish-eagle], which itself was regarded as “rather common” (Cripps 1878). Simson (1882) mentioned that “on a voyage... from Dacca to Sylhet one cannot fail to be struck with the large number of eagles [apparently including this species] seen near the fishing-villages”.

It is clear that a serious decline then took place in the twentieth century. Husain (1985) considered the species to have once been “fairly common”, but thought it currently “endangered”. Sarker and Sarker (1983) stated that around 1970 it was still “a fairly common raptor” on lakes and rivers throughout the country, becoming “rare” in the 1980s. In the Sundarbans, it was also judged “endangered”, with only seven counted during surveys conducted along 3,290 km of waterway between 1981 and 1983 (Sarker 1986b). Sarker and Iqbal (1985) described it as “one of the most endangered birds of prey in Bangladesh”, with a “rapidly declining” population. Despite this view, however, it is “still common in the haors of the north-east”, which indeed probably harbours the largest single population left in the world (Thompson and Johnson 1996). About 80 individuals are said to survive in that area (newspaper report *per* P. M. Thompson *in litt.* 1999), where the species is “widespread with regular nest trees in several villages” (Thompson and Johnson 1996). Around 10 individuals inhabit the vicinity of Tangua haor (P. M. Thompson *in litt.* 2000), with 17 active nests in the Tangua haor/Pashua haor area in 1992–1993 (S. M. A. Rashid *in litt.* 1994).

Myanmar Hopwood (1912b) reported the species to be “fairly common” in Arakan. It was also “very abundant in the plains of Southern Pegu, between the Pegu and Sittang Rivers”

(Oates 1883, 1888). Fish-eagles *Haliaeetus* were once “very plentiful” along the Irrawaddy (= Ayeyarwady) (Harington 1909a) and Pallas’s was the most abundant of this group (Stanford and Ticehurst 1938–1939, Smythies 1986). Stanford (1946) was only certain that it was “the bird of the Upper Irrawaddy” and less certain of areas downstream, but Macdonald (1906) considered it “common” on this river at least as far up as Myingyan district. The evidence suggests that, as with the Indus and the Ganges, the Irrawaddy hosted an almost continuous population of this species along its length. However, the fact that Roseveare (1949, 1952) spent four years in Shwebo district (1930–1934) and two-and-a-half years in Minbu district (1934–1937), both containing stretches of the Irrawaddy, without identifying this species suggests that it had by then seriously declined. Indeed, there are very few field records of the species in Myanmar after the 1930s and a major population crash has apparently taken place.

ECOLOGY Habitat Pallas’s Fish-eagle frequents areas close to freshwater lakes and rivers (Baker 1922–1930, Ripley 1982, Smythies 1986, Inskipp and Inskipp 1991, Roberts 1991–1992). It is generally absent from coasts, tidal creeks or mangroves (Roberts 1991–1992), although wandering individuals may occur in these habitats (there have been records from the Sundarbans mangrove forests, for example; but see Remarks 9). Because of their diet they prefer areas with an abundance of fish and birds (Koning and Dijkzen 1974). The altitudinal range of the species is very broad. In Bhutan it has been recorded mainly in valleys between 600–1,000 m (Ali *et al.* 1996), but extreme altitudes are 150–1,400 m (Inskipp *et al.* 1999a). In Nepal it usually winters between 75 and 275 m but has been recorded on passage up to 3,050 m (Baral *et al.* 1996), and in Tibet it has often been recorded between 4,570 and 4,880 m (Walton 1906, Ali 1946, Lavkumar 1955).

In China, this raptor is found near marshes, lakes and streams and in river valleys or even away from water in arid steppes, usually roosting on cliffs or in open areas in mountains, often near marmot mounds (Wang Xiangting 1991, Zheng Shengwu 1994). In Xinjiang it was always seen in the vicinity of water, usually sitting motionless on the bank of a stream or on low mud cliffs near marshy ground (Scully 1876), and it breeds in the steppes, oases or deserts near the Altay and Tien Shan mountains (Yuan Guoying 1991). In Pakistan, India, Nepal and Bangladesh it also frequents rivers, canals and jheels, usually with nearby large trees where it nests (Anderson 1872a, Baker 1922–1930, Ali and Ripley 1968–1998, Grimmett *et al.* 1998, Choudhury 2000c). It was “seen generally along well-wooded river banks” in Myanmar (Harington 1909a), most often “perched on a gigantic letpan tree or a low cliff, or else beating up and down the river” (Smythies 1986).

Food This species is carnivorous, consuming a wide variety of live or dead prey. Fish of various sizes appear to be the principal source of food in most regions (Anderson 1872a, Ali and Ripley 1968–1998, Roberts 1991–1992). Museum specimens (e.g. in BMNH) are regularly recorded with either whole fish or fish-bones in the stomach. A list of fish species consumed by this eagle in Bangladesh includes *Cirrhina mrigala*, *Labio ruhita*, *Catla catla*, *Notoptera chitala*, *Nystus aor*, *Hilsa ilisha*, *Ompok pubda*, *Wallago atu* and *Amphiomus cuchia* (Sarker and Iqbal 1985). On the Nyang-chu river in southern Tibet, it fed on fish “which come up at that time of year from the Tsangpo” (Ludlow 1927–1928), 4–5 individuals catching three fish in 10 minutes (Ludlow ms). Most fish caught are of mid-size, for instance a 12 inch [c.30 cm] fish in Tibet (Ali 1946), 40 cm fish in Mongolia (Piechocki 1968) and a c.2.5 kg carp in Pakistan (Roberts 1991–1992). Occasionally, however, extremely large fish are consumed: on the Lukhia river in Bangladesh, for example, Cripps (1878) retrieved a c.6 kg fish (thought probably to be a catfish) from a Pallas’s Fish-eagle that had hauled it to the banks but was unable to carry it.

Unlike the Osprey *Pandion haliaetus*, this species does not “plunge for fish, but takes those that have ventured into the shallows or become stranded in drying pools” (Smythies 1986), often swooping on them when they bask near the surface (Donald 1918–1921, Roberts 1991–1992). While this technique is essentially similar to that employed by other *Haliaeetus*

eagles, Pallas's is more flexible and opportunistic in its habits. Smythies (1986), for example, reported them feeding on floating fish carcasses and kleptoparasitising other piscivorous birds such as cormorants and terns (sometimes even when the latter are carrying fish as small as c.10 cm in length: Donald 1918–1921). In Lucknow birds were reported obtaining almost all their food by pirating the catches of Ospreys, Brahminy Kites *Haliastur indus* and Marsh Harriers *Circus aeruginosus* amongst others (Reid 1887, Ali and Ripley 1968–1998). In Punjab and Myanmar, up to five individuals together have been observed following fishermen working with nets and stealing any of their catch left unattended on riverbanks (Donald 1918–1921, Smythies 1986). Birds have also been noted collecting fish from drying canals (Koelz 1940) and visiting well stocked fish-farms (Suwal and Shrestha 1989).

To assume that the diet of the species is restricted to fish would, however, be mistaken. Indeed, Reid (1887) thought that its diet included “birds, snakes, rats, frogs, crabs, turtles—anything in fact but fish, unless, of course, it can get them without too much trouble”. Frogs (especially large “bull-frogs”), turtles and reptiles also feature occasionally as food items (Baker 1922–1930, Rand and Fleming 1957, Ali and Ripley 1968–1998). The snakes *Xenochropis piscator* and *X. cerasogaster* were part of the diet in Bangladesh (Sarker and Iqbal 1985). An eyrie watched by Lowther (1944) contained the shells of five mud turtles and many other shells lay beneath.

Avian prey items are usually associated with water. In the Punjab Salt Range, almost all lakes are devoid of fish and thus the species forages almost exclusively on waterfowl (Waite 1948). This penchant for foraging “largely on aquatic birds” earned it a reputation for being “one of the most destructive eagles” in India (Anderson 1872a), particularly from the viewpoint of wildfowl hunters. In Bangladesh, 1870s, the species was frequently seen to “carry off wounded game” (Cripps 1878, Reid 1887), while in Gujarat Brooks (1875a) “lost many a wounded duck by one of these birds swooping down and carrying it off almost before it touched the water”, and in Sind Ticehurst (1922–1924) remarked that the species was “familiar to all who had done any duck-shooting” because of its habitual piracy. Nestling birds are another favourite food source. Pallas's Fish-eagles have been reported taking a “heavy toll” of young Bar-headed Geese *Anser indicus* in Ladakh (Meinertzhagen 1927) and Tibet (Ludlow 1950). At the end of June, several were seen on a small islet in Orok-nor lake, northern Mongolia, in the midst of breeding colonies of Greylag Goose *Anser anser* and Swan Goose *A. cygnoides*, and were presumably preying on the young of these species (Kozlova 1932–1933). Before it became rare in Gujarat the species reportedly preyed on colonies of cormorants, egrets and spoonbills (Khacher 1996), and it has been recorded taking large numbers of nestling Little Cormorants *Phalacrocorax niger*, egrets and ibises at colonies (Roberts 1991–1992); Macdonald (1906) recorded the leg of an egret projecting from the gape of an eaglet near the Irrawaddy, Myanmar. A Painted Stork *Mycteria leucocephala* colony in India was “entirely decimated by a pair of these birds: they just carried off a squab when they wanted one” (Lowther 1944). In addition, a pair on the Yamuna river apparently “ravished countless clutches” of tern, skimmer and plover eggs on a sandbar (Lowther 1941), although this behaviour has not subsequently been reported (A. R. Rahmani *in litt.* 2000).

While wounded or young birds are favoured, the species can apparently catch healthy individuals. The usual technique is to glide low over the water and snatch unwary birds from the surface (Roberts 1991–1992). Bates and Lowther (1952) saw an eagle in Kashmir “stoop on a flying coot” *Fulica atra* at dusk, while in Punjab the species was seen to hunt coots by dashing at a flock, isolating an individual and stooping on it as it pattered along the surface (Ali 1941). In Gujarat, the vicinity of a plucking tree used by a Pallas's Fish-eagle was “strewn six inches deep” with coot feathers (Inverarity 1886–1888), and Ali and Ripley (1968–1998) considered migrant coots to be one of the staple items during the winter in India. Other bird species reported taken by Pallas's Fish-eagle are Grey Heron *Ardea cinerea* (Whistler 1913)

and Pheasant-tailed Jacana *Hydrophasianus chirurgus* (Mountfort and Poore 1968) in Pakistan, Ferruginous Duck *Aythya nyroca* and Lesser Whistling Duck *Dendrocygna javanica* in Bangladesh (Sarker and Iqbal 1985), Common Pochard *Aythya ferina* in Mongolia (Piechocki 1968), Demoiselle Crane *Anthropoides virgo*, Bar-headed Goose and Purple Swamphen *Porphyrio porphyrio* in India (Munns 1928, Ali and Ripley 1968–1998, Roberts 1991–1992). In Uttar Pradesh, India, a pair were observed catching and consuming adult Ruddy Shelducks *Tadorna ferruginea* (Gandhi and Singh 1995a,b, Singh 2000), as was one on the Orkhon river, Mongolia (Mauersberger 1979). Muir (1916) observed an individual on the Ganges attempt to catch a Great Cormorant *Phalacrocorax carbo* engaged in swallowing a large fish with which it could not fly. At Kallar Kahar lake in the Punjab Salt Range, Little Grebes *Tachybaptus ruficollis* were plucked from the water by a low hovering individual (Waite 1948), and at Sambhar lake, Rajasthan, this eagle apparently fed “on the small waders, which are so plentiful” (Adam 1873).

Apart from birds, it consumes various other living vertebrates when the opportunity arises. Yarkandi shikaris claimed that “it sometimes strikes crows and hares” (Scully 1876); in support of this, a nest in north India was found to contain the remains of a “Common Hare *Lepus ruficaudatus*” (Anderson 1872a). In Tibet and Qinghai, it hunts pikas *Ochotona* and (particularly young) marmots *Marmota* (Wang Xiangting 1991, Zheng Shengwu 1994), while in Mongolia it is reported to take young Eurasian beavers *Castor fiber* (Piechocki 1968).

The species also frequently eats carrion or offal (Baker 1922–1930). This has been reported along rivers in Bangladesh (Tytler 1854) and Bihar (Inglis 1901–1904), while Lowther (1944) mentioned birds bringing a human arm, skull and spinal column to a nest on the Yamuna (= Jumna) river near Delhi. In “eastern Turkestan” (= Xinjiang), a bird was observed feeding on the carcass of a horse (Scully 1876) and in Ladakh one was poisoned while feeding on an Asiatic wild ass *Equus hemionus* (Oberholser 1900). In one instance, an entire dead cat was carried off (Ali and Ripley 1968–1998). At Sirsa, Haryana, it commonly took offal from bird-skinning camps (Koelz 1940). There is even an odd report of an individual observed feeding, presumably on wasp larvae, from a section of the nest of the “paper wasp”, which it held in its claws (Nanjappa 1989). Birds tend to spend much of the time digesting or watching out for potential prey (e.g. Kozlova 1932–1933, Ali 1946).

Breeding Season The timing of breeding for northern breeders differs from their southern counterparts. In Kazakhstan breeding generally begins in March (Dement’ev and Gladkov 1951–1954), as it does in China, where young birds usually fledge in July (Zheng Shengwu 1994). Southern breeders (in Pakistan, India, Bangladesh and Myanmar), however, generally lay eggs from early November to early February (see, e.g., Irby 1861, Anderson 1872a, Cripps 1878, Barnes 1885, 1888–1891, Hume and Oates 1889–1890, Harington 1909a, Smythies 1986). Birds have been observed copulating over a 4–5 week period between November and early December in lower Sind, Pakistan; observations over nine years indicated that the young hatch from mid-December to early January and remain in the vicinity of the nest until late March, when they are able to fly (Roberts 1991–1992). Females generally lay between the last week of October and the second week of November in India (Ali and Ripley 1968–1998), although Tickell (1848) stated that in the Indian plains birds laid chiefly in December and January. One pair in Uttar Pradesh was noted finishing the outer lining of the nest by 10 October and then returning to complete construction three weeks later (Anderson 1872a). In Lucknow, pairs began building “as early as the beginning of October”, and most eggs were found in November (Reid 1887), although they continued breeding sporadically up to February (Jesse 1896–1899). In Jammu and Kashmir, India, the majority of eggs also appear to be laid in January, the coldest month of the year (Bates and Lowther 1952). In Sylhet (Bangladesh) and Cachar (Assam), the species apparently “breeds about the beginning of December” (J. Inglis in Hume 1880b). One pair in Bhutan were nesting in September 1933 (Ludlow and Kinnear 1937). The breeding season in Bangladesh generally runs from

September to March (Sarker 1987c), although one nestling at Alachipur fledged in April (Sarker and Iqbal 1985). In Mandalay district, Myanmar, a nest used two years in succession contained a large nestling close to fledging in February (Smith 1942), suggesting that the species began nesting in September–October as in the Indian subcontinent.

Nest-site Nests are most often placed at the highest point of trees, sometimes slightly lower, on the banks of rivers or close to lakes (Anderson 1872a, Hume and Oates 1889–1890, Donald 1918–1921, Sarker and Iqbal 1985, Choudhury 2000c), usually in a broad fork and overlooking water (Tickell 1848, Reid 1887). Nests in Bangladesh have been recorded 11–24 m above the ground, and usually within 10 m of lakeshores or riverbanks (Husain and Sarker 1971, Sarker and Iqbal 1985). In Pakistan, several nests found by S. B. Doig (in Hume and Oates 1889–1890) were slightly lower, 4–9 m up. In India, these eagles have been recorded nesting in tamarind *Tamarindus indica*, silk-cotton *Bombax ceiba*, peepul *Ficus religiosa*, banyan *F. benghalensis*, shisham (= sheesum) *Dalbergia sissoo*, chenar *Platanus*, and sometimes in coconut palms (Cripps 1878, Hume and Oates 1889–1890, Ali and Ripley 1968–1998, Choudhury 2000c). In Bhutan a recent nest was sited at 25 m in a pine tree (D. Farrow *per C. Inskipp in litt.* 2000), and in Bangladesh nests have been found in banyans (Husain and Sarker 1971) and silk-cotton trees (Sarker and Iqbal 1985). Two nests in the Sundarbans were built in *Sonneratia apetala* and *Excoecaria agallocha* (Sarker and Iqbal 1985), and in Bhutan one was sited on top of a fir (Ludlow and Kinnear 1937). Pairs usually build in very large isolated “letpan” (possibly *Dipterocarpus*) trees in Myanmar, according to Harington (1909a). Trees are less often available in its northern breeding range. In China, while it usually nests in tall trees, the species has been recorded nesting in reedbeds or on high cliffs in treeless highlands (Zheng Shengwu 1994). In Mongolia and southern Kazakhstan it has been recorded nesting on the ground (Sushkin 1938) and around lakes on flattened reeds (Grote 1940), while Seebohm (1882) also reported it breeding in willows on the banks of the Volga in Astrakhan’ and out in open steppes on the ground.

Sites are generally used for many years in succession, either by pairs or apparently their offspring (Reid 1887). A pair at Alachipur nested in one tree for several years, moving to a smaller tree of the same species when the original was felled in 1981 (Sarker and Iqbal 1985); the territory was estimated to stretch “5–7 km eastwards and 7–9 km westwards” (Sarker and Iqbal 1985).

Nest structure Both sexes apparently build the nest, which sometimes takes over a month to construct (Hume and Oates 1889–1890). The nest structure has been described as “a huge platform of sticks, occasionally interlaced with rags and snake skins” (Reid 1887), and lined with hay, rushes, paddy straw, fine twigs or green leaves (Tickell 1848, Hume and Oates 1889–1890, Sarkar and Iqbal 1985). “As the birds use the same nest year after year, it is often of immense size, some of the sticks composing it being the width of a man’s arm” (Barnes 1888–1891). Both members of the pair strike at dying tree branches to break them off, then carry them in their talons to the nest site, lining the structure later with leafy branches; one eyrie in Pakistan was decorated or lined with fresh green branches of *Calotropis procera* and *Tamarix dioica*, and one bird was observed snapping off a mango *Mangifera indica* stem with green leaves and carrying it to an eyrie (Roberts 1991–1992). Two nests in Bangladesh were 140–150 cm long, 100–120 cm wide and 40–45 cm deep (Sarker and Iqbal 1985). In the plains of India, nests of the species were roughly 90 cm in diameter (Tickell 1848).

Clutch, incubation and behaviour In general, 1–3 eggs are laid (Ali and Ripley 1968–1998, Smythies 1986), although four have been recorded in China (Zheng Shengwu 1994) and “very occasionally” in India (Inglis and Lewis 1941). In India, the usual clutch is 2–3 eggs (Anderson 1872a, Reid 1887, Barnes 1888–1891, Hume and Oates 1889–1890), and apparently three in Myanmar (Oates 1882) and Pakistan (Eates 1940–1950). Eggs hatch asynchronously, 2–3 days apart, and it is rare that more than two young survive to fledging (Roberts 1991–1992). If eggs are lost, re-laying occurs within two weeks (Barnes 1888–1891) and, “unlike

most eagles”, often in the same nest that has been robbed, even twice in succession (Hume and Oates 1889–1890).

Both male and female incubate, although the female’s contribution appears to be greater, with the male more regularly bringing her food; incubation lasts 40–45 days (Sarker and Iqbal 1985, Roberts 1991–1992). Even after hatching, the male apparently brings the vast majority of food items to the nestling until it fledges (Sarker and Iqbal 1985). This is contradicted, however, by Bates and Lowther (1952), who stated that “both birds take part in incubation and in procuring and bringing food, mainly fish, to the nest, but the greater part of the task of feeding the young devolves upon the female”. In the first two weeks after hatching, one parent in Pakistan continuously guarded the chicks against marauding crows, but as the young grew in size the female began to leave them and hunt for food to bring to the nest (Roberts 1991–1992). In Pakistan, chicks hatch asynchronously (2–3 days apart) from mid-December to early January, remaining in the vicinity of the nest-site until March when they can fly well, but still receive food from the parents (Roberts 1991–1992).

Migration The migration patterns of Pallas’s Fish-eagle are unusually complex and poorly understood. It is evidently strongly migratory in regions of climatic extremes, tending to be more sedentary or dispersive elsewhere (Cramp and Simmons 1980). In northern parts of the breeding range, for example, rivers freeze over during winter and it is therefore no surprise that the vast majority of individuals vacate the area at that time (Dement’ev and Gladkov 1951–1954). These migratory populations presumably spend the winter months further south, from Iran and Afghanistan to the Indian subcontinent (and possibly Myanmar), where their presence is apparently masked by two winter-breeding populations, one resident and one migrant (Ali and Ripley 1968–1998, Cramp and Simmons 1980). In central Kazakhstan, post-breeding dispersal begins in October while the spring return is dependent on the timing of the thaw, usually taking place in February, with breeding commencing in March (Dement’ev and Gladkov 1951–1954). Northward movement continues through April and May, possibly involving immature birds (Dement’ev and Gladkov 1951–1954). In Mongolia, in the eastern outskirts of the Khangai, the “last one” was noted on 22 September (Kozlova 1932–1933), indicating that this species also leaves this part of its range in winter. At Taolimiao–Alashan Nur in Inner Mongolia, it was reported on passage in April (He Fenqi *et al.* 1996). In Nepal, most records fall between September and mid-May, with passage migrants occurring at either end of this span and a few wintering individuals remaining in between (Inskipp and Inskipp 1991). The species has been recorded as a migrant at various sites such as Kosi barrage (Madsen and Poulsen 1980, Mills and Preston 1981, Heath 1986, Kall and Wallander 1988), while a few individuals (presumably northern breeders) winter in Royal Chitwan National Park and Kosi Tappu Wildlife Reserve (Giri 1995). It has been noted on passage in the upper Kali Gandaki valley, where seven flew south between 4 September and 1 October 1973 (Beaman 1973).

A considerable proportion of the Pakistan and north Indian population appears to be made up of trans-Himalayan migrants. From the large numbers of birds seen in summer around the meandering streams and bogs in the vast treeless expanse of Tibet (Ali 1946), it seems reasonable to surmise that they migrate from the Indian subcontinent after breeding (Ali and Ripley 1968–1998, Cramp and Simmons 1980). On the Ganga Chhu at Jiu in Tibet, “only...a single pair” was seen in September 1932, suggesting that “southward emigration may already have begun” (Ali 1946). The species visits Pakistani Punjab during winter, at which time it breeds, the earliest sighting by Waite (1948) being on 26 September. In North-West Frontier Province, Pakistan, immature birds were regular between 19 October and 18 April during the 1990s (Kylänpää 2000). A similar pattern of occurrence has been noted in the Salt lakes near Calcutta in India, where the species is common between October to April, but disappears during the hottest months, May to September (Ali and Ripley 1968–1998). Along the upper Irrawaddy, Myanmar, the population used to arrive in October and early November, breed, then entirely disappear during the rains (Stanford and Ticehurst 1938–

1939). It is not clear where the birds spent the non-breeding season (summer), but it seems certain that they flew north.

Not all birds in the Indian subcontinent, however, are migrants (Ripley 1982). The species is, for example, resident in Kashmir (Osmaston 1927), most of Pakistan (Roberts 1991–1992) and Bhutan (R. Pradhan *in litt.* 1998). Similarly, in Lucknow division, it was a “permanent resident” in the nineteenth century (Reid 1887) and is still present year-round at many wetlands in northern India; in Assam it is described somewhat equivocally as both “mainly a winter visitor” and “by and large resident” by Choudhury (2000c). In Bangladesh, it appeared to be resident in Faridpur district in the 1870s (Cripps 1878); pairs and their young abandon breeding territories in June or July when the country is widely flooded and food plentiful, but their movements during the non-breeding season are not clear (Sarker and Iqbal 1985). It is very difficult, however, to be certain that the species’s presence year-round from Pakistan to Bangladesh does not in fact involve a replacement of South Asian breeders after they move to Tibet with an influx of non-breeding North Asian birds.

THREATS Shortage of prey, loss of habitat, disturbance, and the effects of agricultural chemicals pose a general threat to the species throughout its range. Furthermore, it is declining partly as a result of heavy hunting pressure on raptors, especially in South-East Asia. Extraliminally, in the former USSR, an anti-raptor campaign in the 1950s–1960s similarly led to a decline in numbers of this eagle, notably in Kazakhstan, where (e.g.) protection measures for musk-rat populations probably led to its extirpation in the Ili river delta (Galushin 1983, Berezovikov 1991). An account of threats in the Asian region follows.

Habitat loss In general, the degradation of wetlands and the removal of nest sites poses the major threat to the species. *Pakistan* Although the population of large raptors was still fairly healthy in the 1970s, rapid declines were occurring in response to “deforestation, drainage of marshes, land-use” and, with particular reference to this species, it was mentioned that “big trees in the surroundings of lakes are becoming scarce and the eagles need such trees for nesting” (Koning 1976). Further discussion of threats to wetlands in the country appears under Greater Spotted Eagle *Aquila clanga* and Marbled Teal *Marmaronetta angustirostris*. *India* While this species used to be one of the commonest raptors of the Gangetic plains and some semi-arid zones of India, it has become rare almost throughout chiefly because of the drainage and degradation of wetlands (Samant *et al.* 1995). Furthermore, rapid human colonisation and use of wetlands has caused disturbance and deforestation of adjacent land (Samant *et al.* 1995). All this pressure has reduced the availability of feeding, roosting and nesting sites; some site-specific examples are given below. Loss of large trees has been rife throughout India because of the demand for fuelwood and timber; even in Keoladeo National Park, a nest tree of this species was toppled in February 1980 for this reason (Breedon and Breedon 1982). Rapid siltation is a problem at Wular lake, Jammu and Kashmir, and at most other wetlands in the Western Himalayas, such as Haigam lake, owing to wholesale deforestation of montane watersheds (Scott 1989). Pallas’s Fish-eagle was thought to have declined in Gujarat partly because of the damming of large rivers (Khacher 1996). Habitat in Corbett National Park is being altered by the damming of rivers and destruction of riverine forest to the detriment of fish-eagle populations (Naoraji 1997). However, despite the damming of the Beas river to form the Pong Dam reservoir, Himachal Pradesh, the species has remained common (Pandey 1993c). Harike lake, Punjab, illustrated a problem affecting many Indian wetlands: it has become clogged with water hyacinth *Eichhornia crassipes* (over 70% of the lake was covered in 1989) and suffers from siltation such that there are fears that it is drying out and becoming unsuitable for wildlife (Ali *et al.* 1982, Scott 1989, Singh 1992). Asan barrage, Uttar Pradesh, is also becoming overrun with water hyacinth as well as *Ipomoea fistulosa* and *Typha elephantina*, with consequent habitat loss for waterbirds; it is also silting up rapidly (Singh 2000). In Sibsagar district, Assam, and doubtless throughout much of the Brahmaputra valley, local people cut

canals to drain water from small wetlands, substantially reducing the amount of habitat available for waterbirds (Choudhury 1991). Information about threats at Deepor beel, Assam, appears in the equivalent section under Baer's Pochard *Aythya baeri*, and at Dihaila jheel in Scott (1989). *Nepal* An account of threats to wetland areas in the country appears under Lesser Adjutant *Leptoptilos javanicus* and Greater Spotted Eagle. *Bangladesh* The removal of tall trees in rural areas is reducing the population of this species as it has nowhere else to nest (Khan 1983b, P. M. Thompson *in litt.* 1997). Extensive *Barringtonia* forests once thrived around many lakes in the country, but these have been almost entirely destroyed (Scott 1989). This factor is thought to be much more destructive than hunting (see Remarks 11). Although Pallas's Fish-eagle once had a broad range in Bangladesh, its population apparently started to decline in the 1960s because of the harvesting of trees (e.g. *Alstonia scholaris* and *Bombax ceiba*) for matches and plywood production (Khan 1983b). Furthermore, the increasing demand for firewood used domestically, in brick ovens and tobacco curing, has eliminated many taller trees (*Ficus*, *Syzygium cumini* and *Mangifera indica*) on farmed lands where the eagle used to nest (Khan 1983b). The draining of extensive wetland areas is also reducing numbers (Sarker and Iqbal 1985, P. M. Thompson *in litt.* 1997). Around Tanguar haor, one of its last strongholds, forests at the edge of the wetlands are being destroyed for their timber by a local who owns the fishing rights (newspaper report *per* P. M. Thompson *in litt.* 1999). Efforts have been made to stop this process, which is reducing the availability of nest sites, but their success is not known; of further concern is a government scheme of oil and gas exploration throughout the country which is causing considerable damage to some natural habitats and is likely to continue to do so (P. M. Thompson *in litt.* 2000). *Myanmar* The current situation is unknown, but the general impression is that natural habitats, including (or perhaps especially) wetlands, are under severe and uncontrolled pressure (Lwin 1995, Khin Ma Ma Thwin *in litt.* 1997; see Threats under Lesser Adjutant and Pale-capped Pigeon *Columba punicea*).

Disturbance The loss of suitable habitat detailed in the previous section is compounded, at least in South Asia, by increasing disturbance at wetlands. *Pakistan* In general, wetlands are intensively exploited to the detriment of wildlife (see Ali 1928, 1936). In at least two instances too much human disturbance in the vicinity of the nest-site was undoubtedly a contributory factor to the abandonment of eyries (Roberts 1991–1992). Crows are attracted to the eyrie during nesting by decaying prey remains, and perhaps then rob the nest contents (Roberts 1991–1992), a potentially growing problem in areas where crows are increasing as human commensals. *India* The massive human population of India places extreme pressure on wetlands; these have become increasingly overrun with fishermen, hunters and general human traffic, and this in turn has led to increased disturbance and hunting and a diminution of habitat quality (Ali *et al.* 1982, Scott 1989, Singh 1992). At many Indian wetlands (e.g. Harike lake, Dihaila jheel and Deepor beel) 24-hour fishing causes (or until very recently caused) much disturbance (Scott 1989, Barman *et al.* 1995). Asan barrage in Dehra Dun district, Uttar Pradesh, is heavily disturbed by motorboats and poaching of waterbirds (Singh 2000). The cultivation of lake and river margins with rice and other crops disturbs many watercourses and wetlands (Scott 1989). Disturbance in Assamese wetlands also severely disrupts their ecology (Choudhury 2000c, see Threats under Baer's Pochard). *Bhutan* Human disturbance along major rivers appears to be increasing (C. Inskipp *in litt.* 2000). *Bangladesh* Massive population expansion into the twenty-first century (110 million inhabitants in 1990, apparently destined to double by 2020) will undoubtedly exert huge pressure on wetlands and their resources with potentially disastrous effects on their associated fauna (Wallace 1993). It has become clear that, apart from hunting, "the major cause of the rapid decline in the wildlife resources of Bangladesh is habitat disturbance" (Rahman 1995). Previously the Sundarbans were undisturbed because of the presence of tigers, crocodiles and king cobras, but now the whole forest is disturbed at all times of night and day by "a large number of wood cutters, fishermen, honey collectors, wooden boats and mechanical vessels" (Sarker 1985). *Myanmar* A huge

increase in human population and the associated development and disturbance of river systems and wetlands has reduced populations of this eagle (Scott 1989). Dense human populations are almost continuous along the Irrawaddy, Salween and Chindwin such that the species now apparently breeds in very few localities (Khin Ma Ma Thwin *in litt.* 1997).

Pollution The role of pollution in the decline of Asian raptors is possibly underestimated; it is clear that large quantities of agricultural and industrial chemicals find their way into the environment, especially the aquatic environment, and either reduce vertebrate prey populations or build up through the food chain causing death or reduced breeding success in predators (see, e.g., Samant *et al.* 1995, and Threats under Greater Spotted Eagle and Imperial Eagle *Aquila heliaca*). *China* The species is poisoned by pesticides used to control rodents in China (Zheng Shengwu 1994). *Pakistan* The “use of pesticides” was partly implicated in the large declines in raptor populations in Pakistan by Koning (1976). *India* Indian wetlands tend to be polluted by industrial waste and run-off of organochlorine pesticides from fields; this pollution reduces the prey base and interferes with reproduction (Samant *et al.* 1995). Organochlorines contamination of fish at Keoladeo National Park (Vijayan 1990) has been linked to the poor recent breeding success of the species at this site (Samant *et al.* 1995). The erratic water supply to these wetlands (Samant *et al.* 1995) exacerbates contamination by industrial effluents and pesticide run-off from nearby farmland (see Muralidharan 1992, Ramachandran and Vijayan 1994). A discussion of other threats here is under Sarus Crane *Grus antigone*. In addition, fertilisers are frequently applied to the agricultural hinterland of wetlands, and subsequent run-off causes severe deterioration in wetland quality, perhaps most notably in the Himalayas (Scott 1989). At Wular lake, threats include contamination with domestic and industrial waste from peripheral areas and from Srinagar, 40 km to the south-east along the Jhelum river (Scott 1989). A study in Corbett National Park on Grey-headed Fishing-eagles concluded that low breeding success was probably linked to significant levels of pesticides (especially dieldrin) in the food chain (Naoroji 1997). Fishermen in the area use damaging techniques such as dynamiting and deliberate poisoning with pesticides, causing disturbance and poisoning of piscivorous raptors (Naoroji 1997). These threats, also noted in Gujarat, are increasingly likely to apply to Pallas’s Fish-eagle almost throughout its South Asian range (Khacher 1996). In Dibru-Saikhowa National Park, Assam, thiodan, dieldrin and other non-biodegradable pesticides are used in winter to kill fish, doubtless with detrimental effects on wetland ecosystems (Choudhury 1995b, 1997). This practice is presumably widespread in the Brahmaputra lowlands. Pollution of Himalayan rivers, specifically in the Hemis High Altitude National Park and environs, is thought to be increasing owing to the careless dumping of waste coal tar after road construction activities (Samant *et al.* 1995). *Nepal* Chemical fishing in tributaries of the Sapta-Kosi is thought to pose a threat to wetland birds at Kosi Tappu Wildlife Reserve as poison residues presumably enter the main river system and perhaps partly explain the falling numbers of waterbirds in the area (*Oriental Bird Club Bull.* 21 [1995]: 15–20).

Shortage of prey Intensive hunting of wildfowl in Pakistan, northern India and Bangladesh has presumably contributed to the decline in food resources for Pallas’s Fish-eagle in those areas. Ali (1936) commented that “no one who has visited the larger dhands or jheels in ... northern India during the cold weather can have failed to remark upon the magnitude of the netting operations that go on throughout this season for supplying the markets of the larger towns, both near and distant, with wildfowl of every description for the table”. Local inhabitants around many lakes apparently subsist largely on duck meat during the winter (or they did when duck, coot and goose numbers were high enough); at Manchar lake alone, the turnover in the early twentieth century was reportedly enormous, many thousands of birds being trapped monthly for sale and consumption (Ali 1928, 1936). With the increasing human population, hunting pressure has been extreme in Pakistan and northern India and overall wildfowl numbers have fallen dramatically as a result; this unsustainable exploitation

has caused a huge reduction in available food for this species, other large raptors, and humans (see Ali 1936, George 1964, Samant *et al.* 1995). Overfishing, with consequent knock-on effects for piscivorous raptors, has been quoted as a problem in Gujarat (Khacher 1996), Corbett National Park (Naoroji 1997) and the Sundarbans (Rashid 1993).

Hunting Further information regarding this threat to large raptors in Asia appears under Greater Spotted Eagle. *China* Overhunting is a problem for game species on the Tibetan Plateau (MacKinnon *et al.* 1996), but it is not clear how seriously this species is affected. In some regions, its tail feather is called *yaoyu* (meaning “jade at the waist”, hence the Chinese name *yudai haidiao*: “sea-eagle with a jade band”), and it is sometimes hunted for these feathers (Wang Xiangting 1991). *India* Hunting in India is at least occasionally a threat, perhaps most often in Assam: Choudhury (2000c) noted “occasional hunting and collection of eggs and young” of this species. Harike lake is threatened by wildlife poachers (Singh 1992). *Bangladesh* Eagles are occasionally persecuted by leaseholders of wetlands in the north-east of the country, where they are regarded as hunters of fish and wildfowl and thus vermin (P. M. Thompson *in litt.* 2000; but see Remarks 11). *Myanmar* Hunting levels in the country are thought to be very high (see Threats under White-winged Duck *Cairina scutulata*).

MEASURES TAKEN Legislation Pallas’s Fish-eagle is included on Appendix II of CITES. It is legally protected in China (nationally protected species: first class), India (Wildlife Act 1972: Schedule I), Nepal and Myanmar.

Protected areas and habitat management *Mongolia* In Mongolia, some of the range is protected (D. Batdelger *in litt.* 1997), including Mongol Daguur Strictly Protected Area and Numrug Strictly Protected Area. *China* It has been recorded in several protected areas in China, including Zhalong National Nature Reserve in Heilongjiang, Dalai Hu National Nature Reserve and Dalai Nur Nature Reserve in Inner Mongolia, and Niao Dao (Qinghai Hu) Nature Reserve in Qinghai (see Distribution), and in must occur in several more, notably the vast Qiang Tang Nature Reserve in northern Tibet (see MacKinnon *et al.* 1996). However, it is unclear which reserves support significant populations, and whether they actually afford the species any real protection. *Pakistan* It has been recorded in Lal Suhanra National Park. *India* There are records from Bhindawas Wildlife Sanctuary, Bordoibam-Bilmukh Sanctuary, Burachapori Wildlife Sanctuary, Deepor Beel Sanctuary, Dibru-Saikhowa National Park, Dudwa National Park, Corbett National Park, Kaziranga National Park, Keoladeo National Park, Laokhowa Wildlife Sanctuary, Manas National Park, Nameri National Park, Orang National Park, Panidihing Sanctuary, Pench National Park, Pobitora Wildlife Sanctuary, Rajaji National Park, Ranthambore National Park, Sultanpur National Park and Uduwa Lake Sanctuary. In addition, the Pong Dam reservoir has been declared a Bird Sanctuary by the government of Himachal Pradesh and the wildlife department plans to implement management recommendations and extend the boundaries of this area (Pandey 1993c). In Uttar Pradesh, Nawabganj Priyadarshani Bird Sanctuary receives protection (Scott 1989). The species occurs in the National Chambal Sanctuary, which was established to protect gharial *Gavialis gangeticus* along a near-pristine stretch of the Chambal river and which also supports a very important population of Indian Skimmer *Rynchops albigollis*. In Jammu and Kashmir, Haigam Rakh is protected and managed as a game sanctuary and Hokarsar is a wildlife sanctuary (Scott 1989). Dihaila jheel lies at least partly in the Karera Bustard Sanctuary (but see Measures Taken under Great Indian Bustard *Ardeotis nigriceps*). *Nepal* The species occurs within Kosi Tappu Wildlife Reserve and Royal Chitwan National Park. *Bangladesh* Information regarding conservation initiatives in the Sundarbans appears in the equivalent section under Lesser Adjutant. However, while White-bellied Sea-eagle *Haliaeetus leucogaster* is common there (see Remarks 9), Pallas’s Fish-eagle is uncommon and a much more important area for the latter are the scattered wetlands of the Haor basin in the north-east of the country. Despite recommendations to establish appropriate freshwater protected areas there (Rashid 1993),

very little has been achieved. Some community management projects recently began at certain haors (Hail, Hakaluki and Halir) but there is little evidence that any tangible benefit will reach wetland birds (P. M. Thompson *in litt.* 2000). *Myanmar* The species has occurred at Mohingyi Wetland Sanctuary.

MEASURES PROPOSED *Protected areas and habitat management* *Mongolia* D. Batdelger (*in litt.* 1997) has judged that the area of habitat under protection needs to be increased. *Pakistan* Protection of nesting sites and reduction of disturbance at wetlands would benefit the species. Koning (1976) suggested the provision of nesting platforms and planting of suitable nesting trees adjacent to wetlands, and this approach should be attempted in appropriate localities. *India* The Assamese population of the species in general presents the best opportunity for preserving the species (in particular Kaziranga and Nameri National Parks) and efforts should be made to manage relevant protected areas appropriately. Other site-specific proposals appear under Greater Spotted Eagle. Water hyacinth infestation is a problem on many wetlands in northern India and some form of control, preferably mechanical rather than biological, needs to be exercised to preserve their ecosystems (Scott 1989). Recommendations at Keoladeo National Park appear under Sarus Crane. In general, nesting sites should be protected from disturbance and degradation, and tall trees near suitable wetlands maintained. *Nepal* Adequate protection is required for suitable habitat in Royal Chitwan National Park. The species will also benefit from proposals outlined under Lesser Adjutant and Greater Spotted Eagle. *Bhutan* River systems and adjacent forest should be protected from degradation as the country opens its borders to tourism and development. *Bangladesh* Proposals for the Sundarbans are under Lesser Adjutant. The most important area for this species is, however, the north-east with its scattered wetlands or haors. The conservation of crucial sites in this region should be pursued, and the population of this species carefully monitored (P. M. Thompson *in litt.* 2000). Several haors have been recommended for declaration as Ramsar sites and a management strategy was prepared for the best of them, Tangua haor (Rashid and Anisuzzaman *per* P. M. Thompson *in litt.* 2000). Recently, the Ministry of Forest and Environment publicly confirmed its intention to protect Tangua haor, but the district administration simultaneously issued fishing permits for the site (P. M. Thompson *in litt.* 2000); this problem needs resolution in favour of Ramsar status. Again, protection of tall trees is a priority in existing or potential breeding territories (Sarker 1985). Pressure could be reduced on rural wood resources by machine-drying tobacco and using gas for brick production and domestic purposes (Khan 1983b). Maintenance of water levels is important in relevant wetland areas to provide suitable feeding habitat during dry periods and because deforestation and disturbance of nesting areas increases dramatically when sites are dry (Sarker and Sarker 1985a).

Control of pollution In general, environmental pollution should be minimised as the effects on populations of raptors can be highly deleterious. Strict controls have been urged on the use of organochlorine pesticides and chemical fishing throughout the Indian subcontinent, especially in areas close to crucial protected areas and national parks (Sarker and Sarker 1985a, Samant *et al.* 1995).

Education Conservation awareness programmes are a requirement around key sites for this species. In Mongolia, a public awareness programme has been proposed (D. Batdelger *in litt.* 1997), and in Bangladesh rural education programmes have been called for to help conserve birds dependent on wetlands by reducing habitat alteration and hunting (Forest Department 1974), but as yet nothing has been achieved (P. M. Thompson *in litt.* 2000).

Research In general, more needs to be known about seasonal movements in this species, its population size, and the exact reasons for its decline. *India* A national census is overdue. As it is conspicuous and relatively easy to identify (at least when adult), observers are “unlikely to miss” it at wetlands (Choudhury 2000c), and it is thus an ideal subject for a coordinated survey. Quantification of the population size in the country and monitoring of trends is a

vital tool for future conservation effort. *Nepal* Research is needed on chemical fishing in the Kosi area, as this might be a grave threat to human welfare as well as local ecology (*Oriental Bird Club Bull* 21 [1995]: 15–20). (*Myanmar*) No specific recommendations have been made for the country, but a survey of the main river basins to establish the presence and status of any surviving populations would be an important step forward.

REMARKS (1) This species is sometimes called a “sea-eagle”, but as it rarely ventures into (or even near) marine environments, the name Pallas’s Fish-eagle (e.g. Inskipp *et al.* 1996) is more appropriate. (2) An undated specimen (in FMNH) purportedly from Songdo (in fact labelled Songdo Common School: D. E. Willard *in litt.* 2000), Kyonggi (Keiki) province, South Korea (site now in Incheon city), is correctly identified but the locality is questionable, perhaps referring to a collection of stored specimens rather than the site where the bird was shot (D. E. Willard *in litt.* 2000). There is otherwise no record of the species from Korea. (3) Mention of the species in southern Vietnam by Wildash (1968), apparently suggesting that it is regular in occurrence there, is presumably in error. However, an old specimen (in MNHN) is labelled “Cochinchina” and may have come from southern Vietnam. Given the likelihood that this is the bird Oustalet (1899) gave as coming from Cambodia, it is best to regard the record as unlikely and there is therefore no confirmed record for Vietnam. (4) Shawshean island was included in Jiangsu province by Cheng Tso-hsin (1987), but it is now in Shanghai municipality. (5) Roberts (1991–1992) stated that the species was absent from Baluchistan, either overlooking or rejecting this Ormara record; in addition, an egg reported to be from this species was presented to Barnes (in Ticehurst 1926–1927) at Chaman (Baluchistan/Iran border) in March (year unspecified), but given the lack of direct (or subsequent) observation in the area this record should be treated as unconfirmed. (6) The species is listed for Bandipur Sanctuary (Neginhal 1977), Karnataka, without supporting details, a record that is considered provisional given its improbability. Although it is listed for Tamil Nadu (Badshah 1968), it is unlikely to occur in the state, and a record of six at Thangumarhada, 1995–1997 (Thirumurthi and Balaji 1999) is treated as unconfirmed. A bird seen “fishing” at a lake in Warangal, Andhra Pradesh, in 1984 (V. J. Rajan *in litt.* 1988), may have been correctly identified but no details were provided and it is thus treated as provisional. Thus there are no confirmed records from any of these three Indian states. (7) The species was listed, perhaps hypothetically, from many Indian protected areas by Samant *et al.* (1995). While most of these records may be accurate, they are not supported by evidence and several are clearly in error (for example, it is listed for several unlikely sites for which no primary records were traced, but not for Keoladeo National Park where it was well known). Therefore no sites in the Distribution section are included solely on the basis of this report. (8) Distributional data drawn from Choudhury (2000c) were received too late to include in the mapping process. (9) As Patuakhali is a coastal site, the record possibly refers to (immature) White-bellied Sea-eagle *Haliaeetus leucogaster*. The same applies to some records (not the specimens from Burigoalni, some way inland) from the coastal Sundarbans (White-bellied Sea-eagle is common there: Sarker and Sarker 1985a). (10) Pallas’s Fish-eagle was reported to breed in south-west Transbaykalia in the late nineteenth century (Molleson 1896, 1897 in Kozlova 1930). Difficult to reconcile with this is the statement in Kozlova (1932–1933) — purportedly a translation of Kozlova (1930) — that it was a “fairly common” breeding bird there, all the more so as the species was described as rare in the area (Buryatia) in the late nineteenth and early twentieth centuries (Molleson 1891 and Kozlova 1930 in Dorzhiev 1988). (11) There is some evidence that some local people in Bangladesh did not (and perhaps still do not) persecute the species, this perhaps explaining the fairly healthy populations remaining in some areas (P. M. Thompson *in litt.* 2000). Cripps (1878) was certainly asked not to shoot the eagles nesting in the property of a local Hindu and the species still nests in trees alongside houses in the haors region, albeit principally because there are no other nest sites available (P. M. Thompson *in litt.* 2000).