

1,800m, 28 April–1 May and on 5 May. Another male behaving territorially on 4 May about 300m from the first. Both were in second-growth scrub in a logged and heavily grazed valley in the forest. The territorial behaviour suggests possible breeding. The only known breeding areas are in southern Shaanxi and extreme northern Sichuan provinces. This would be a significant breeding range extension if confirmed. Territorial behaviour consisted of very strong and agitated response to playback of the respective birds' song.

EURASIAN ROCK-BUNTING *Emberiza cia*: common in cultivation edge and second-growth scrub around Dafengding, 1,100–1,400m.

YELLOW-THROATED BUNTING *Emberiza elegans*: several 1,000–1,100m in secondary scrub on 27 April; one at 1,100m, 6 May.

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Observations of Relict Gulls *Larus relictus* on passage at Beidaihe, People's Republic of China

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Relict Gulls were recorded on passage at Beidaihe in the autumns of 1986, 1987 and the spring of 1988. Most of the birds were in first-winter plumage, which had been previously unreported. Detailed descriptions of this plumage reveal the salient features of white head, dark bare parts, hindneck streaking and distinctive wing and tail pattern. Brief notes on adult winter and probable second-winter plumages are also given.

In the autumns of 1986 and 1987, and in spring 1988, numbers of Relict Gulls *Larus relictus* were seen on passage on the coast of the Gulf of Bohai, at Beidaihe, Hebei province, People's Republic of China. The status of this little-known gull was summarized by Kitson (1980) and Melville (1984), and the current and historical position of the species in China is to be the subject of a subsequent communication (Bakewell, Duff and Williams in prep.). The observations at Beidaihe are the first concentration of sightings away from the breeding areas, and were mostly of birds in previously undescribed winter plumages (although photographs of a first-winter bird at Beidaihe in autumn 1987 have recently been annotated by Grant 1988). Immature Relict Gulls have previously been described in juvenile (Auevov 1971, Kitson 1980) and first-summer (Fisher 1985) plumages. This paper summarizes the dates of occurrence, behaviour and plumage details of the species at Beidaihe. Terminology follows Grant (1986).

DATES OF OCCURRENCE

The first record of Relict Gull at Beidaihe was of an adult, in moult from summer to winter plumage, on 23 August 1986. It was present for less than half an hour after initial observation, before flying south with Common Black-headed Gulls *L. ridibundus*. This, and all subsequent observations during autumn 1986, were made on the Heng-Ho (Heng He) estuary, known as the 'Sand Flats' (Williams 1986, Williams *et al.* 1986). Two first-winter birds were recorded on 8 September, and thenceforth up to seven first-winters were present until the China Cranewatch expedition left Beidaihe on 20 November. The sedentary nature of these birds (they could be seen at any state of the tide or time of the day) and their habitual preference for particular areas on the Sand Flats suggested that a small number of birds

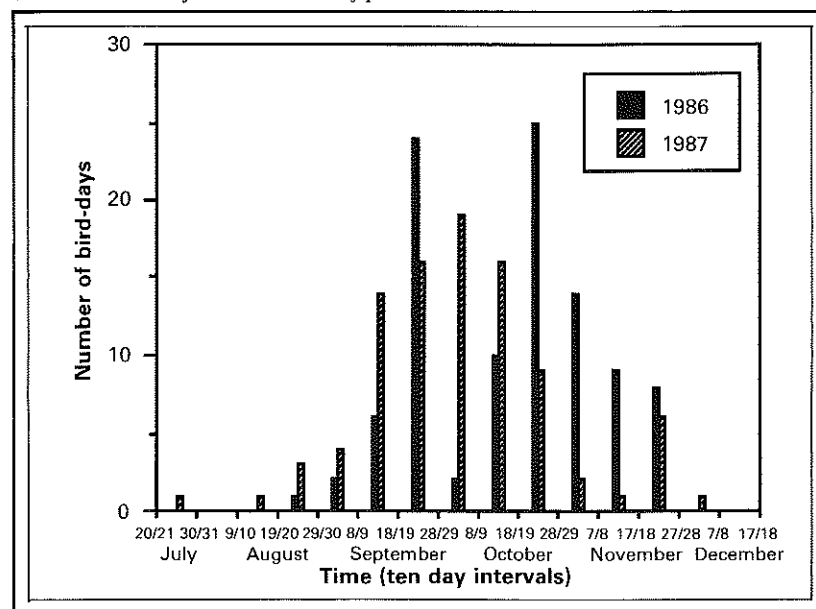
relative to bird-days was involved. Further evidence to support this theory was provided by the presence of an individual with blackish coloration on the breast, presumably some form of feather contamination, from 19 October to at least 2 November.

In autumn 1987, the first Relict Gull observation was of an adult in breeding plumage flying north on 29 July (birdwatchers being present from 26 to 29 July). When observers returned on 18 August, the species was recorded in every week, apart from the first half of November, until the end of the survey, on 30 November. A daily maximum of seven birds was recorded on 18 October. First-winter birds again predominated. Although the details of ages of all birds are incomplete, observations also included two adults in winter plumage, one on 10 and one on 16 October, and a probable second-winter bird on 15 October.

Despite coverage during spring 1985, 1986 and 1987, Relict Gulls were not recorded on return migration until spring 1988. Then the only observations were of a single adult at the Sand Flats on 19 and 20 April, and of eight adults flying south, calling, over the Yang-Ho (Yang He) estuary to the south of Beidaihe on 25 April. All these birds were in full summer plumage.

The timing of the migration in 1986 and 1987 is represented by a histogram (see Figure).

Figure. The occurrence of Relict Gull at Beidaihe in the autumns of 1986 and 1987, expressed in terms of number of bird-days recorded in ten-day periods.



BEHAVIOUR AND HABITAT PREFERENCE

In 1986 the behaviour of first-winter Relict Gulls was consistently different from that of other gull species present in numbers (Common Black-headed, Mew *L. canus kamschatschensis*, Vega *L. vegae* and Yellow-legged Gulls *L. cachinnans mongolicus*). Gulls favoured four localities covered by the survey: the Yang-Ho and Tai-Ho (Dai He) river estuaries, both characterised by the appearance of reasonably extensive mudflats at low tide, the Heng-Ho Sand Flats and, to a lesser extent, the Heng-Ho reservoir and surrounding fishponds (for map, see Williams 1986, Williams *et al.* 1986). In autumn 1986 Relict Gulls were recorded only from the Heng-Ho Sand Flats. This was a very extensive, largely sandy area surrounding the narrow tidal Heng-Ho river channel. Within it the Relict Gulls preferred the river and its gently shelving banks, and drier sandy areas well away from both the river and the tideline. They were rarely seen on the muddier areas and tideline, preferred by most gulls using the area. Perhaps as a result of this different habitat preference, Relict Gulls rarely associated with other species, although two were observed roosting with Common Black-headed Gulls on one occasion. They sometimes walked through groups of loafing gulls of other species, but did not join such flocks. Twice, interspecific antagonism from Common Black-headed and Mew Gulls was noted when Relict Gulls strayed into areas frequented by the other species. Kitson (1980) noted the normally unsociable nature of the species at Orok Nor, Mongolia.

Unlike the four commoner gulls, which followed a regular feeding and roosting cycle dependent on the state of the tide, the Relict Gulls were constantly active during daylight hours. Occasionally one would spend a few minutes preening or standing motionless, but roosting was observed only once. Most of their time was spent walking apparently aimlessly, or more obviously searching for food. The birds sometimes fed in the river channel, upending in the manner of a dabbling duck *Anas*, but most foraging was on the Sand Flats themselves. Here the hunting posture was very erect, with the neck stretched and the head held high. At breeding sites, by contrast, the birds adopt a hunched horizontal posture, with head held low, when looking for food (S. C. Madge, in Harrison 1985). Zubakin and Flint (1980) report that at nesting time the birds feed predominantly on small Diptera flies. The hunched posture and low elevation of the head would presumably facilitate the location of small abundant prey on or just above the ground. At Beidaihe the only identified prey items were small crabs, seen taken in one instance in 1986. The erect posture would presumably help in detecting such relatively large, scattered prey. Two first-winter birds on 17 and 18 November 1987 at the Heng-Ho Sand Flats were seen to take crabs, from both shallow water and exposed sand. The crabs were swallowed whole, and neither washed nor dismembered. It seems likely that crabs and items of similar size make up a significant part of the diet outside the breeding season. Zhuravlev (1975) records fish and crustacea as well as insects amongst prey items taken by

Relict Gull. Small insects were generally not abundant on the Sand Flats, and were almost certainly absent late in the autumn, whereas small crabs were evident for much of the period. However, an inspection of the site on 20 November 1986 revealed only a few shellfish, and no crabs (or insects), the area having become drier due to less frequent tidal covering. Conditions were such that few species continued to feed on the Sand Flats, Mew and Common Black-headed Gulls preferring some nearby drained fishponds. Nevertheless the remaining Relict Gulls continued to feed in this area.

Although the Relict Gulls showed no tendency to flock with other species, they tended to associate loosely with one another. Occasionally, more obvious social behaviour was observed, when three or four birds would chase each other vigorously, both on the ground and in the air, calling frequently.

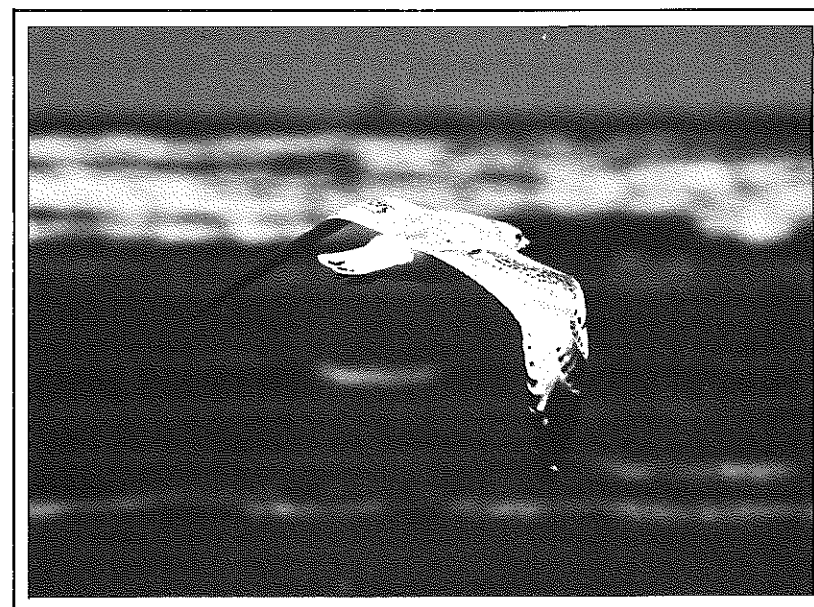
In autumn 1987, many of the Relict Gulls recorded at Beidaihe were observed on the south side of the Yang-Ho estuary, approximately 4.5 km south of the Heng-Ho Sand Flats. This area had been inaccessible the previous year, so the species may well have used the site in 1986. The turnover rate in 1987 was more rapid than in 1986, the longest staying bird being present for only three days. Turnover was particularly fast at the Yang-Ho, and feeding and roosting behaviour was similar to that of other gulls present. The birds were seen at or shortly after dawn, and appeared to be resting prior to onward migration; they departed when local people arrived to tend their fishponds. Nine birds were recorded passing straight over Beidaihe.

STRUCTURE AND GENERAL APPEARANCE OF FIRST-WINTER BIRDS

As mentioned above, gull species available for comparison at Beidaihe in 1986 were Common Black-headed, Mew, Vega and Yellow-legged. The Relict Gulls appeared almost twice as bulky as Common Black-headed when on the ground, substantially smaller than Vega and Yellow-legged, and very slightly bigger and longer-legged than Mew (*L. c. kamschatschensis* being noticeably larger than the nominate race). On the ground the first-winter Relict Gulls were very distinctive (see cover). The contrast between the generally pale plumage and dark bare parts was striking. The white head showed no trace of a hood. Also distinctive were the blackish-centred, broadly white-tipped tertials and extensive tibial feathering. Even when plumage details were not discernible, the posture and structure of the birds was characteristic. When walking, the Relict Gulls had an erect stance, with thick neck extended, a full breast and deep chest, and with the line of the back approaching 45°. The high-stepping, elegant, rolling gait was reminiscent of a starling *Sturnus*. When taking prey, the head was held low, the neck hunched, and the line of the back horizontal.

In flight, the wings appeared longer and more pointed than those of Mew

Plates 1 and 2. Relict Gulls in first-winter plumage at Beidaihe, September 1987. (P. C. Noakes, S. Jensen)



Gull. The wingtips curved upwards slightly, and the flight action was rather stiff-winged. The legs were occasionally held half-lowered during short flights. As mentioned by Fisher (1985) the upperwing pattern is distinctive when seen well (see Plate 1 and 2). From a distance, when the wing covert markings were poorly visible, the overall impression was of a gull resembling a pale second-year Mew Gull. However these wing covert markings were variable in prominence, and on some individuals were strong enough to form the 'W' pattern seen on some smaller gull species in first-year plumage. Also of variable prominence was a rather poorly marked secondary bar.

DETAILED DESCRIPTION OF FIRST-WINTER BIRDS

Bare parts

Iris dark. Legs looked proportionately long, usually dark grey or black, but tinged olive on one individual and brownish on another. Bill appeared short, thick and rather pointed compared to that of other large gulls. Culmen length roughly equal to distance between front of eye and culmen base. Culmen straight for basal two-thirds, gently curved towards tip. Lower edge of lower mandible angled distinctly upwards at gonys, contributing to pointed bill-tip shape. Culmen only three-quarters as long as lower edge of bill, due to extensive forehead feathering, which extended almost to nostril, thus enhancing the short, thick appearance of bill. Head feathering often appeared to cover the gape. This extent of head feathering led to unusual facial expression perhaps most comparable to Audouin's Gull *L. audouinii*. Bill colour variable, sometimes all black, particularly early in autumn, otherwise black-tipped, with basal third to half greenish-olive or grey, becoming paler towards base; at a distance, appeared wholly black. Two birds seen in mid-November 1987 had significantly paler bare parts than those on birds of the early autumn. In particular the bill base on one was markedly pale (fleshy grey?), making the bill appear more slender and not unlike that of first-winter Mew Gull, and the legs were grey with a fleshy tone, especially to the feet. Mouth pink.

Head

Forehead, crown, lores, ear coverts, chin, throat, foreneck white. Crescents above and below eye white, but thick and readily visible. Indistinct grey eye crescent (in front of eye). This was sufficient to give a somewhat slit-eyed appearance at times. One individual showed small dark mark immediately behind eye, but this was not usual. When forehead feathers raised, forehead steep, head peaking just in front of eye, flat crown sloping slightly downwards to sharply angled rear crown, creating rather square head-shape. When lowered, forehead slope gentler, head peak at rear of crown, creating head-shape more reminiscent of Great Black-headed Gull *L. ichthyaetus*. Nape white or lightly flecked with small dark spots, often appearing slightly

shaggy. Hindneck densely flecked with small, well defined, slightly crescentic dark brown to gingery spots. Markings at base of hindneck thinner and more crescentic, extending onto sides of neck and breast, where sparser, and occasionally forming poorly defined virtually complete collar. Extent of hindneck spotting variable, and probably very susceptible to wear. Neck appears thick and well feathered, especially from behind, in accordance with other observations of Relict Gull (D. J. Fisher verbally), and sometimes appears ruffed.

Upperparts

Mantle and scapulars pale grey, similar in colour to those of Common Black-headed Gull. Some individuals retained a few juvenile scapulars, which had cold mid-brown subterminal crescents. Rear scapular fringed, or totally, white. Marginal coverts white. Lesser coverts cold mid-brown, fringed white; or pale grey, tipped white (a few of the latter only, usually outer coverts). Extent and prominence of brown marking variable. Inner two or three median coverts largely cold mid-brown, with base of outer web pale grey. Remaining median coverts pale grey with cold mid-brown subterminal arrowheads or chevrons, extending slightly up feather shafts. Greater coverts pale grey, tipped white, with cold mid-brown subterminal chevrons usually present on outers, and more prominent and always present on inner four or five. Tertiaries large and rounded, with very broad white fringes, and black or dark brown central spots; shaft of uppermost tertial occasionally showed white, and the black mark on this feather had white centre on some individuals. Dark feather centres to tertiaries generally rather striking on Beidaihe birds, but tertiaries almost wholly white 'with small brown subterminal spots' on the first-summer seen in early June 1983 (Fisher 1985). This is probably the effect of wear and fading on these feathers, but may perhaps indicate a spring tertial moult, which occurs on some small and medium-sized species in their first spring (Grant 1986).

Secondaries had black or dark brown subterminal spots, probably extending to base of feathers, with white edges and broad white tips. These dark areas were partially obscured by the greater coverts in flight, and completely so at rest, so never obvious. Less prominent on outer three or four secondaries on some birds (P. C. Noakes *in litt.* 1988). The effect was of a row of subterminal spots, or 'pearls' (Grant 1988), along the trailing edge of the inner wing, appearing more prominent on some individuals than on others.

Primaries 10-6 pale grey, tipped white; 10-8 with small black subterminal spot; 7 with black subterminal bar on inner web; 6 with broad terminal black bar on inner web and narrow subterminal bar on outer web. Primaries 5-1 predominantly black, with thin white tips; 5,4 and possibly others, had whitish inner webs with black terminal bar; 5 also had white subterminal spot on outer web, joined to pale on inner web on some birds, appearing as isolated mirrors on others. Outer webs of remaining primaries black.

Primary 1 had white subterminal mirror on inner web. Greater primary coverts white-tipped. Inner four wholly white; outer six with blackish outer webs, whitish inner webs with blackish subterminal bar. Median primary coverts wholly pale grey, or pale grey with blackish subterminal spots. Alula white with black subterminal spot on inner web, or more extensively blackish, forming isolated dark spot on leading edge when seen head-on. Four evenly spaced primaries visible on closed wing. White mirror on first primary only visible on underside of far wing. Primary projection beyond tail slightly shorter than on Common Black-headed Gull. Rump and uppertail coverts white. Outer two pairs of tail feathers all white. Remaining tail feathers white with narrow, well defined, black subterminal band.

Underparts

Breast, belly, vent and undertail coverts white. A few individuals retained pale brown, white-tipped juvenile flank feathers. White tibial feathering extensive, covering half tibia length, giving prominent 'trousered' effect. Axillaries, underwing coverts, secondaries, inner primaries and primary coverts white. Sixth primary had black subterminal spot. Outer five primaries black, first with small white subterminal mirror. Outer three or four greater primary coverts black. Thus underwing white with clearly demarcated black wedge on leading edge of outer wing.

Call

Uttered in autumn 1986 when chasing other Relict Gulls. A nasal downwardly inflected 'kyeu' reminiscent of (first-year) Mediterranean Gull *L. melanocephalus*. A similar call, transcribed as a low-pitched, drawn-out 'ke-arr', only slightly disyllabic, was noted from the adult birds present on 25 April 1988.

DESCRIPTIONS OF RELICT GULLS IN OTHER NON-BREEDING PLUMAGES

Second-winter plumage

Brief views of a bird tentatively aged as a second-winter were obtained by one of the authors (A.P.) on 15 October 1987. The following details were noted: *Bare parts*: Bill black with dark red basal third. Legs black. *Head*: White with small black mark behind eye, and marking on nape more restricted than on first-winter. *Upperparts*: No markings visible on coverts. Tertiaries as first-winter, noted as dark brown with whitish edges. White tips to primaries more prominent in folded wing than those on an adult bird seen the following day. The retention of dark-centred tertiaries by this bird is noteworthy.

Adult winter plumage

Descriptions of the bare parts and head pattern of Relict Gulls in adult winter plumage seen on 23 August 1986 (by G.J.C.) and on 16 October 1987 (by A.P.) were as follows: *Bare parts*: Legs and bill deeper, more scarlet-red than on Common Black-headed Gull. Bill had narrow grey subterminal area, and slightly paler tip (1986 individual). Bill and legs quite bright red (1987 individual). *Head and neck*: Less bull-necked than first-winters (1986). Head-shape noticeably rounder, less angular, than on first-winters (1987). Well defined black patch on ear-coverts similar to that on (adult winter) Mediterranean Gull. Crown streaked above this. Small amount of streaking on hindneck.

DISCUSSION OF SOME PLUMAGE CHARACTERS OF FIRST-WINTER RELICT GULLS

The appearance of the first-winter birds at Beidaihe agrees in most respects with expectations from the published descriptions of other immature plumages (juvenile and first-summer) of Relict Gull. The first-winter plumage of gulls should be separated from the juvenile by a late-summer moult of head and body feathers (Grant 1986). The description of juvenile plumage by Auevov (1971), summarized by Kitson (1980), reports the largely white head and brown-spotted hindneck shared by first-winter birds at Beidaihe. The bare parts description - 'The beak is black, lightening somewhat towards the base. Feet dull grey' - also matches the Beidaihe birds.

Auevov's description of remiges and retrices of 'young, flying' Relict Gulls from Kazakhstan is also broadly similar to those of first-winters at Beidaihe, including the two white outer pairs of tail feathers, which distinguish young Relict Gull from all the other hooded gulls of the region, as well as from Mediterranean and Mew Gull. There is however one striking difference. After an overall description of 'primary wing-feathers' as being more black than those of the adult, followed by individual description of the first to the seventh 'wing-feather' in turn, Auevov then simply states 'the remaining feathers are clean white'. Whether this refers to the remaining primaries, or to the remaining remiges, is unclear. From photographs and descriptions taken at Beidaihe, it is obvious that first-winters here had particularly noticeable dark tertial centres, and dark subterminal marks on the inner primaries and secondaries of variable prominence but apparently consistent presence. Moreover, Fisher's (1985) notes on a first-summer Relict Gull from central Mongolia describe the secondaries as having small dark marks, in accordance with our observations.

It may be that Auevov is in error in his observation, or that his description is based on a specimen of an unusual individual, although, as already stated, the marks on the secondaries are variable in prominence on birds at

Beidaihe. Mukhin (1974) points out that nestlings in Transbaikalia differ from those from Kazakhstan in being greyish-white with indistinct greyish spots, rather than pure white. It is not clear whether this difference is a real one, or one of interpretation, but it does hint at the possibility of plumage differences between eastern and western populations.

The near-white colour of the downy young is a feature separating Relict Gull from both Mediterranean Gull and Brown-headed Gull *L. brunnicephalus*, and one which allies it with Great Black-headed Gull. The wing patterns of adult *ichthyaetus* and *relictus* are also very similar, as pointed out by Vaurie (1962). The two species are similar in first-winter plumage, and share some features unusual for hooded gulls, such as a largely white head and extensive hindneck mottling. Overall size, and bill proportions, should normally be sufficient to differentiate between these species. Relict is more superficially similar to Mew, and Great Black-headed to Vega and Yellow-legged, than either are to each other. When size and proportions are not discernible, the broad white secondary tips of *relictus* distinguish it from *ichthyaetus*, while the white outer two pairs of tail feathers are completely diagnostic. Unbarred axillaries, underwing and rump are additional features that separate Relict from Mew (and Ring-billed *L. delawarensis*) Gulls. Confusion with immature Brown-headed, Black-headed, Black-tailed *L. crassirostris* and Saunders's *L. saundersi* Gulls is unlikely now, but may have occurred in the past, when immature plumages were little known, and the existence of *relictus* unsuspected (Bakewell, Duff and Williams in prep.). Now that Relict Gull is on the ornithological map, it seems to be sufficiently distinctive to be unlikely to be overlooked or mistaken for other species.

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