

A survey of the breeding birds of the Wakhan Corridor

R. J. Timmins, September 2008

EXECUTIVE SUMMARY

This report presents the results of a field survey of the 'Wakhan Corridor', Badakhshan Province, Afghanistan. The survey was conducted between the 30 May and the 1 July and covered three main areas of the 'Wakhan'. Close to seven days were spent surveying the lower valleys of the Panj and Wakhan rivers between Ishkashim and Sarhad, approximately eight days were spent surveying the central narrower Wakhan river valley between Sarhad and Bozai Gumbaz and 14 days were spent surveying habitats in the Little Pamir.

In each region surveys covered representative areas of the main habitats, with proportionately more effort (relative to landscape extent) focused on wetland and riparian habitats. In the Little Pamir the survey covered a range of altitudes between the valley floor at ca. 4000 m to ca. 5000 m on adjacent mountain slopes. A somewhat narrower altitudinal range was surveyed in the other regions.

Bird communities were much as expected, based on results of previous work in the region. A few of the species recorded are likely to be new records for Afghanistan, but this was to be expected given the poor ornithological coverage (especially of highest altitudes) of Afghanistan to date. The bird fauna not unexpectedly is primarily Himalayan in character, and the majority of species have relatively large global ranges. A few of the species present have a more restricted western Himalayan distribution (e.g. Himalayan Pied Woodpecker), but for no species is the Wakhan region likely to be globally significant. In general the area has a relatively depauperate breeding bird fauna, a consequence most likely to be due to the arid conditions, high altitude, isolation of the Wakhan from nearby biomes and potentially the transitional nature of the area on the margins of several major biomes. In a national context the area likely has significance for a few species notably for breeding Bar-headed Goose, and some high altitude species probably at the southwestern edges of their global ranges (e.g. Tibetan Snowcock, Tibetan Sandgrouse and Red-fronted Rosefinch).

Threats to birds are relatively minor. Probably the most threatened species are the waterfowl breeding in the Little Pamir, their low numbers and vulnerability while breeding (and potentially while moulting) are some cause for concern. Evidence for hunting, was not directly witnessed, but likely occurs, and even low levels of exploitation may be causing declines. Birds dependent on riparian habitats, principally several warblers, are potentially at risk if riparian tree and bush cover decreases. This is certainly a possibility, especially as the region undergoes economic and cultural changes, although the outcomes are not likely to be easily predictable. Vultures may also be at risk from a combination of factors, the current populations are almost certainly dependent on domestic livestock for a significant if not majority of their sustenance. Threats to vultures stem mainly from persecution of birds and reduction of food sources. The later is largely dependent on the outcome of cultural and economic changes affecting the way livestock are managed.

Although, in a global environment where a significant number of species are on the brink of extinction, the Wakhan area does not warrant significant input of global conservation resources, there are potentially arguments for wildlife conservation activity, and thus some prioritisation is warranted. In particular in a national context, national conservation resources might be directed towards species of national significance, also ecotourism development of the area

would likely benefit and in turn fund rehabilitation of 'wildlife spectacles' in the area, and development oriented projects could be orchestrated to also address wildlife conservation needs (as a healthy environment is beneficial also to human wellbeing). In addition to the potentially threatened species mentioned above, focal areas for wildlife conservation monitoring and activity would include maintaining and potentially enhancing riparian woody cover in the lower and central valley areas, monitoring and protecting breeding waterfowl on the wetlands of the two Pamirs and monitoring vulture populations throughout the Wakhan area.

ABBREVIATIONS AND CONVENTIONS

ca.	approximately
DD	Data Deficient
FAO	Food and Agriculture Organization of the United Nations
GNT	Globally Near-threatened
GT	Globally Threatened
GT-CR	Globally Threatened - Critically Endangered
GT-EN	Globally Threatened - Endangered
GT-VU	Globally Threatened - Vulnerable
IBA	Important Bird Area
IUCN	the World Conservation Union
RJT	R. J. Timmins
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WCS	Wildlife Conservation Society
[]	Species record is provisional or unconfirmed

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Abundance categories have been assigned to bird species encountered during the survey, in relation to their relative abundance as determined during the course of the survey. Abundance was assessed on a five point scale based on the encounter frequency, taking into account the appropriateness of methods to detection of a species, and other factors (including ecology) that affect a species's observability (see Section 2.2.). These abundance categories are:

Abundant – equivalent to groups being recorded an average of 15 times daily (or for flocking species flocks being recorded several times daily)

Common – equivalent to being recorded daily

Frequent – equivalent to being recorded on over half of days

Occasional – equivalent to being recorded on fewer than half of days

Present – abundance not assessed

These abundance estimates are given in Table 4 (Annex 1), but are also stated in a textual form in the individual species accounts (Section 3.2.).

Bird taxonomy, systematics and English names follow Rasmussen and Anderton (2005).

Orthographic style of the English names for wildlife follows the guidelines of Inskipp *et al.* (1996).

Scientific names are not given in the text for those species recorded during the survey, but they can be found in Table 4 (Annex 1).

For habitats see Section 2.2.

Important Bird Areas and 'Biome-restricted Species' are designations developed by BirdLife International (2008a), as part of a project to develop a global network of sites, the conservation of which, in theory, should ensure the protection of the world's bird diversity.

The names and spellings of Wakhan localities used in the report follow, where available, a set of standardised names used by the WCS Afghanistan Program. However, there are the following usages specific to this report.

'Pamir' (always capitalised *per* WCS policy) is taken to mean the broad high altitude valleys, of which there are two, in the eastern portion of the Wakhan. Other authors appear to use the term more loosely to cover all eastern areas of the Wakhan, including the very high peaks between the Wakhan and Panj (Pamir) rivers. The mountainous area north of the Hindu Kush, covering much of eastern Tajikistan, can be referred to as the 'Pamirs'. But in this document any mention of this range is specifically referred to as the 'Pamir Range'.

Southern Mountains are used here to mean the mountains bordering the southern edge of the Little Pamir.

Northern Mountains are used here to mean the mountains bordering the northern edge of the Little Pamir.

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1.0. INTRODUCTION

This report presents the results of a field survey of the 'Wakhan Corridor' (hereafter referred to simply as the Wakhan), the long tongue of land covered by the Wakhan District of Badakhshan Province, Afghanistan that is sandwiched between Tajikistan and Pakistan. The survey was conducted between 30 May and 1 July 2008 and covered three main areas of the 'Wakhan'. The surveys concentrated on evaluating status and conservation needs of the breeding bird fauna of the area, but all aspects of the site's biodiversity significance have been considered in the recommendations given at the conclusion of this document.

The project had the following aims and objectives:

Aim: To evaluate the status and conservation needs of the breeding bird fauna of the area.

Objectives:

- Assess the status of bird populations, especially those of a subset of focal species, within the area.
- Characterise other wildlife communities of the site including habitat parameters.
- Assess threats to bird populations in the area.
- Evaluate and prioritise conservation needs of bird species.
- Recommend wildlife conservation interventions, to be built into a wildlife conservation strategy for the Wakhan area.

This was one of the first comprehensive surveys of the bird fauna of the Wakhan during the late spring and early summer months when resident and summer visiting birds are breeding. It was also the first recent comprehensive survey of birds in the Little Pamir.

Descriptions of the area can be found in a number of other sources (e.g. Petocz 1978a, c, UNEP & FAO 2003, Bedunah 2008) and thus is not covered in detail here. One area of the Wakhan has been managed prior to recent decades as a hunting reserve (Petocz 1978c, UNEP & FAO 2003). Since the fall of the Taliban regime, the area has once again become the focus of wildlife conservation interest and activities, although at present there are no legally designated protected areas. Parts of the area have been included in the Important Bird Area (IBA) system of the Middle East, developed by BirdLife International (Evans 1994); these areas however have no formal national recognition.

Recent ornithological work in the Wakhan has included one focused survey for birds in the late summer and autumn of 2007 (12 September to 8 October), which primarily covered the Big Pamir, the upper Panj (Pamir river) valley above Gaz Khan, the lower Wakhan valley below Sarhad and the high mountains between the latter two valleys (Ayé 2007). Significant incidental observations have been made by Ostrowski (2006 a, b, 2007, pers. comm. 2008) primarily during the course of research into livestock in the area; this author has also undertaken breeding birds surveys focused especially on waterfowl in the Big Pamir, but has not visited the Little Pamir (S. Ostrowski pers. comm. 2008). There are also the incidental observations of others (e.g. UNEP & FAO 2003, Habib 2007). Historically the area appears to have been little surveyed, however, in spring 1874 Colonel Biddulph and Dr. Stoliczka of the 'Second Yarkand Mission' apparently crossed the Pamirs travelling down the Wakhan valley at least as far as

“Panjah” (presumably Qala-i-Panj), before returning east in May (Sharpe 1891; see also Henderson and Hume 1873). In the 1970s the ‘Wakhan’ area was surveyed on a number of occasions by biologists investigating the wildlife conservation potential of the area for a UNDP, FAO and Afghanistan Ministry of Agriculture project, and collections of birds and mammals were made by two expeditions (Nogge 1973, Niethammer 1973, Petocz 1978a, Sayer and van der Zon 1981). There was at least one Russian ornithological study of the area undertaken (Argandeval 1983).

2.0. METHODS

2.1. Survey areas and effort

Survey areas and effort are summarised in Table 1. For the purposes of analysis the survey area has been split into three geographical regions, each relatively distinctive not only in physical features of the landscape, but also in terms of wildlife habitats and human usage. The three geographical regions used are as follows:

Lower main valleys (Panj & Wakhan valleys – Ishkashim to Sarhad): typically, broad valleys with large rivers, surrounded by high mountain ranges, the valley bottom rising from ca. 2600 m at Ishkashim to ca. 3200 m at Sarhad. Relatively densely populated with communities dependent on both agriculture and livestock, the valleys are heavily modified by human activity, primarily in the form of traditional, low-intensity, irrigated agriculture, with livestock grazing in intervening areas. These broad valley bottoms represent the lowest altitudes found in the study area. The survey focused only on valley bottom habitats.

Central Wakhan valley: a much narrower valley, the Wakhan River rising in altitude from ca. 3300 m to 3900 m. A very low density of permanent and seasonal settlement, currently no agriculture, although signs that perhaps in the past some very small areas had been farmed (see Petocz (1978a: p 22)). The survey focused primarily on smaller wooded side valleys and the valley slopes to moderate but not high altitudes.

Little Pamir: a very broad valley, with an undulating floor between ca. 3950 m and 4250 m, with numerous wetlands, surrounded to the north and south by high mountains (termed for the purposes of this report the Northern and Southern Mountains). A relatively low density of permanent (Kirgyz) residents, subsisting on a pastoral lifestyle using seasonally dependent traditional locations of habitation. The survey attempted to survey all major habitats including those present in adjacent mountains up to the permanent snowline starting at ca. 4500+ (highest altitude surveyed was ca. 5000 m).

Table 1. Summary of survey areas, habitats and effort

Survey area	Dates	Elevation	Habitats*	Effort (person days)
Lower main valleys (Panj & Wakhan valley – Ishkashim to Sarhad)	30 – 31 May & 29 June – 1 July: Ishkashim; 31 May – 1 June: Qala-i-Panj; 2 – 3 June: Gaz Khan; 3 – 7 & 29 June: Sarhad.	All ca. 2600 m to 3300 m		May – June: 3 days foot; 1 day driving. June – July: 1.5 days foot; <1day driving.
			River and associated wetland	Most effort
			Farmland & ‘plantations’	Most effort
			Riparian scrub & woodland	Qala-i-Panj and Gaz Khan areas only; ca. 1.5 days effort
			Pasture / meadow	Localised; little effort
			Semi-desert / alpine steppe	Observations mainly while driving, or distantly from other habitats
Central Wakhan valley (Sarhad to Bozai Gumbaz)	7 – 9 & 23 – 28 June	All ca. 3400 m to 4000 m		Early June: <3 days; late June: >5 days. Of which ca.:
			Alpine steppe (predominant) / Alpine heath (small areas)	5 days
			Birch-willow thicket	3 days
			Rivers / streams	1.5 days
			Scree slopes	Minimal effort
Little Pamir	9 – 23 June			14 days. Of which ca.:
		4000-4500	Alpine steppe (predominant)	Majority of effort >6 days
		4200-4800	Alpine heath	>5 days
		4600-5000	high montane	>1 day
		4200-5000	Scree / crags	>3 days
		4000-4500	Alpine meadow	>5 days
		4000-4100	Lakes & bogs**	3.5 days
		4000-4800	Streams	>3 days

*Habitats, and effort in different habitats, are not mutually exclusive, for instance some areas could be classified as both alpine meadow and bog, or alpine heath and scree / crags. Also, for example, while surveying lakes, birds would be recorded on adjacent alpine steppe.

** ‘Bog’ was only categorised as a wildlife habitat for those birds using the wetland component of the ‘bog’, otherwise the habitat was considered as alpine meadow.

2.2. Field Methods

Type of data collection

The survey focused on subjective methods of observation rather than rigorous quantitative methodology. This was largely because of the surveyor’s prior experiences that collecting rigorous quantitative data requires substantial effort for relatively few data, and to be meaningful requires analysis in the context of comparative data, collected in comparable circumstances. For a short-duration survey it is next to impossible to gather quantitative data that are meaningful in determination of conservation management. Primarily the surveyor focused attention on subjectively assessing the status, distribution and threats facing both individual bird species and bird communities in the study area.

The extent of effort given to surveying particular bird species/communities was not equal nor randomly determined. Instead, effort was disproportionately apportioned on the basis of two factors, namely threat level facing, and population significance of, bird species/communities

present (or suspected) in the survey area. This bias in survey effort was used because conservation management of the area for birds would most logically be prioritised on the basis of species with an actual conservation need (usually species threatened in some way), and preferentially conservation resources would logically be allocated to species with significant populations, rather than to species with little significance. Thus species thought to be (potentially) threatened in the area or globally, or bird communities in habitats thought to be locally threatened were accorded more survey effort than species/communities thought to have no major threats facing them. The same disparity in effort was also accorded to species that were judged to potentially have significant populations (i.e., a large proportion of the regional or global population) within the Wakhan area, versus those that were considered not to occur in significant populations (note many common and abundant species do not have significant populations in the Wakhan area).

Threats to birds and habitats, along with likely population significance were assessed prior to the survey from a review of current literature pertaining to recent surveys (see Section 1.0.), verbal and other correspondence with persons familiar with the area (see acknowledgements), and by a review of other information sources, especially BirdLife data on Threatened and Near-threatened species (e.g. Evans 1994, BirdLife 2001, 2008 a, b, IUCN 2007) and information in Rasmussen and Anderton (2005). In particular Ayé (2007) had provided a list of recommended species for further study. During the survey potential threats and population significance were continually assessed, allowing survey effort to be appropriately directed. Assessment of threats was made primarily through opportunistic observations of human activities (or characteristic signs of previous activity) and in a few instances from informal interviews (see below). The primary focal species during the survey were thus:

- Breeding waterfowl
- Vultures
- Saker Falcon
- Snowcocks
- Sandgrouse
- Pigeons
- Ibisbill
- Woodpeckers
- Leaf-warblers
- Rosefinches

No attempt was made to conduct a full inventory of the birds present at the sites visited. But, given the observers unfamiliarity with the fauna and the paucity of knowledge on the regional status of many species, the survey did aim to establish the status of as broad a range of species as possible, while still balancing the need to gather data on the focal species. However, purely conducting an inventory type survey would have entailed a rather different survey strategy and would likely have provided many fewer data of significance for wildlife conservation management. All data presented in this report were collected by the author (RJT) unless stated otherwise. Additional records of significance were made by Naqeebullah Mostafawi (NM – WCS Field Research Assistant) and Bilal Habib (BH – mammal survey program) during the same survey period.

Opportunistic observation method

Data collection goals for the focal species were similar and could usually be assessed simultaneously by the survey methods employed. Other species of note were recorded opportunistically. Systematic counts of other species (including common species) were undertaken occasionally.

Surveys followed no rigorous protocol and were primarily based on opportunistic observation while walking. They concentrated on recording the focal species. Pace was varied depending on the potential of making encounters; habitat, terrain, time of day and species of focus were all factors affecting choice of pace. Some periods of static watching were included, but this constituted a very low proportion of total effort. Effort focused on areas thought likely to be productive for recording focal species. Bird signs, principally the droppings of snowcocks, were also searched for when appropriate during these surveys. An attempt was made to cover a sufficient number of areas, to allow a realistic assessment of the general status of birds (especially focal species) in each habitat and region. Details of generally all encounters with focal species were recorded and the locations of significant observations recorded with GPS. The extent and detail of records varied with species and circumstance e.g. all observations of Bar-headed Geese were recorded but Horned Larks were only systematically recorded on a few occasions. In general, full systematic recording only took place for the first few hours of morning observations and or when entering a new habitat type.

Often a telescope and tape recorder and microphone were carried. The telescope was particularly useful in helping to identify distant birds such as pipits which could not be approached closely and or whose identification depended on observation of cryptic and difficult to see features, while tape recordings were made of the calls of several species to help aid identifications, this was particularly the case with warblers, the identification of which is still ongoing.

Assessment of numbers

Abundance categories were assessed for each bird species encountered during the survey, in relation to its relative abundance as determined during the course of the survey. Abundance was assessed on a five-point scale based on the encounter frequency, taking into account the appropriateness of methods to detect a species, and other factors (including ecology) that affect the observability of a species (see Timmins and Ou 2001). For many species, abundance could not be assessed. These abundance categories are:

Abundant – equivalent to groups being recorded an average of 15 times daily (or for flocking species flocks being recorded several times daily);

Common – equivalent to being recorded daily;

Frequent – equivalent to being recorded on over half of days;

Occasional – equivalent to being recorded on fewer than half of days;

Present – abundance not assessed.

Abundance estimates are described in individual species accounts (Section 3.2.) and in Table 4 (see Annex 1).

Waterfowl and other wetland bird surveys

In the case of waterfowl two other survey techniques were used, these were static observation with a telescope to scan islands and shores of lakes for birds, and the use of a two man inflatable boat to visit islands and search for evidence of breeding. Three areas of Chakmatin Lake were searched by boat in this way.

Vultures

It was intended to try and survey vultures by use of animal carcasses (strategically placed) to attract feeding groups. However, in practice during the survey it was not possible to implement this method effectively. The main constraint to the method was the short duration available at any site, which essentially made it difficult to carry out the necessary preparation (arrange for purchase of a sheep or goat, locate a suitable feeding site i.e. away from human disturbance, secure the carcass in place) and still have several days available for vultures to locate the carcass. Only at one site in the Little Pamir was a partial carcass staked out, on a prominent hillock in the middle of the valley; it however failed to attract any vultures.

Wildlife habitat characterization

Notes on general characteristics of wildlife habitats were recorded (i.e. structure, frequency of certain characteristic plant species, substrate types) in relation to observations of use of such areas by the bird community. Categorisation of wildlife habitats follows where possible the categories used by Petocz (1978a), which have also been used and adapted by Ayé (2007). Given the primary surveyors lack of experience in the region and with similar habitats elsewhere, the distinction between different wildlife habitats and their correspondence with those of the aforementioned authors were difficult at times to determine (especially between steppe, heath and meadow), however there is likely to be reasonable general correspondence and thus legitimate grounds for comparison with the results of these authors. Some wildlife habitats used in this report however differ (or potentially differ) from those of the aforementioned authors.

Pasture / (alpine) meadow: any area with continuous (or at least nearly continuous) cover of predominantly graminoids. Areas in the lower valleys are presumably maintained as such by heavy grazing (pastures), while those in the high alpine zone are presumably more natural in occurrence. The alpine meadows of this survey would seem to correspond with the 'sedge meadows' of Petocz (1978a) and Ayé (2007).

Alpine steppe and heath: areas of steppe were taken to be those areas where the predominant vegetation type was small usually sparse 'woody' herbs, while areas of heath were taken as areas where 'softer' stemmed herbs and graminoids dominated. Following this classification vegetation was generally most sparse and 'driest' in steppe, while 'flower' richness seemed highest in heath.

Scree / crags: a potentially rather expansive assortment of habitats and terrain types, potentially covering rather fine loose shale scree to massive-boulder fields, small rock outcrops to substantial rocky ridges. As used in this report however, scree implies areas with larger rocks, where the rocks add a significant structural component in contrast to areas of relatively uniform alpine steppe or heath. 'Crags' is used in the same sense where rock outcroppings gave a particular area a significant structural difference from a slope with few rocks or outcroppings. The vegetation around and amongst areas of scree and crag could be classified usually as either alpine heath or steppe, and for a proportion of the birds the presence of rocks was perhaps of little significance, for others however the structural element of the rocks was likely very important. No bird species were thought to be associated with areas of relatively fine scree with almost no vegetation, and no birds appeared to be particularly associated with very high barren slopes, both types appearing to have a very sparse bird community. Both Petocz (1978a) and Ayé (2007) seemed to have used somewhat different definitions for 'scree' type habitats.

Riparian scrub and woodland, and birch-willow thicket: The lower main valleys support relatively dense riparian formations with sea-buckthorn and willow structurally dominant, at the higher altitudes of the central Wakhan valley region, in steep, small, side valleys riparian

thickets of birch and willow occur. These two formations appear to have been treated the same by Petocz (1978a) and Ayé (2007).

Some bird species were associated with what might be termed minor wildlife habitats, ones potentially classifiable as a subset of some of the above-mentioned habitats. The most significant of these were sparse juniper and rose formations, in alpine steppe and heath and sometimes in areas of crags, only found in the central Wakhan valley area, and barely vegetated cliff faces in all three regions.

'Gulleys' as used by Petocz (1978a) is not used as a wildlife habitat in this report.

Observations of human use

Incidental observations of human use (frequency of people observed in different habitats, signs indicating the frequency of general use, abundance of signs of wood extraction, etc.) were made whenever applicable during the survey.

Interviews with local people

Interviews focused on gathering first-hand information on a small subset of the target species. Each interviewee was asked about some or all of these species. Interviews primarily concentrated on local knowledge of the locations of nesting sites of large waterbirds (especially Bar-headed Goose), and the historical status of these and some other species. But most interview results proved to be equivocal.

Bird Identification

Bird field guides (or for that matter any field guide) cannot be relied upon unquestionably for accurate identification of birds to species under field conditions. In many cases certainty of identification only comes once an observer has observed many individuals of a given species, along with many individuals of potential confusion species. Thus in the case of an observer new to a bird fauna, even one experienced elsewhere, as the primary observer was, it was necessary to confirm some identifications by other means. This primarily entailed a visit to the bird collections of the Natural History Museum, Tring, U.K., whereby preserved skins were examined against field-notes taken during the survey. This was particularly important for confirming the identity of rosefinches, crows and pipits observed during the survey, but also helpful in the identification of larks and *Bucanetes* finches. For some species vocalisations are distinctive of the species and thus more useful than visual characters in identification to species. Identification, at the time of writing, is still pending for some of the leaf-warblers and reed-warblers observed during the survey, however, tape-recordings made during the survey have been sent to specialists to attempt identification on the basis of vocal characteristics.

3.0. RESULTS

3.1. Bird communities

The bird communities found during the survey were much as predicted, based on the results of previous work in the region (see Table 4; Annex 1). A few of the species recorded are likely to be new records for Afghanistan (see Table 4, Annex 1), but this was to be expected given the poor ornithological coverage (especially of highest altitudes) of Afghanistan to date.

The breeding bird fauna not unexpectedly is primarily western Himalayan in character. What is meant by this is that the Wakhan's bird communities have most in common with other Himalayan areas; however the bird species that make up the Wakhan's bird fauna are in the most part much more widely distributed than the Himalayas *per se*. Groups of species will

however often have similar distributions, usually because they share similar habitat preferences. Several such biogeographical groupings of bird species can be seen within the Wakhan's bird fauna, and an overview of these is helpful in conservation assessment. Despite being Himalayan in character, few species in fact are strictly Himalayan in distribution, the primary example being Himalayan Pied Woodpecker (many species with distributions restricted to the Himalayas clearly do not reach the Wakhan). Rather, the bulk of the bird species could be described as having, either wide-ranges covering both the Himalayas and Central Asia (e.g. Lesser Sand Plover, Rosy Pipit, Brant's and Plain Mountain Finches), or a more restricted western Himalayan and western Central Asian distribution (e.g. Mountain Chiffchaff, Sulphur-bellied Warbler, Greenish Warbler, Hume's Whitethroat and Fire-fronted Serin), the Wakhan being generally close to the southeastern range limit for many of the latter species. Of the species with a Himalayan and Central Asian distribution, a characteristic subset can be thought of as characteristically high altitude Tibetan Plateau species at the southwestern extreme of their distribution in the Wakhan (e.g. Tibetan Sandgrouse and Tibetan Snowcock) or somewhat more widespread Central Asian Plateau species (e.g. Bar-headed Goose, Altai Accentor and White-winged Snowfinch) but which are absent, as breeders, from the greater part of the Himalayas.

Another large proportion of birds are basically generalists with wide global distributions (e.g. Eurasian Tree Sparrow), but a subset of these are essentially Eurasian species on the southeastern limits of their distribution (e.g. Blyth's Reed-Warbler, Common Starling, Eurasian Jackdaw and Carrion Crow), while another group comprise Palearctic species breeding at high altitude on the southern limits of their range (e.g. Redshank, Horned Lark, Isabelline Wheatear and Water Pipit). A small but interesting group of species typified by Red-headed Bunting, White-winged Pied Woodpecker and Yellow-breasted Tit have essentially western Central Asian distributions, the Wakhan being close to their southeastern limit (these species not penetrating the Himalayan region *per se*). Along similar lines to this latter group are species with a western Central Asian and Middle Eastern distribution (e.g. Crimson-winged Finch) or simply Middle Eastern (e.g. Brown-necked Raven).

There are a few primarily South Asian species, exemplified by Brahminy Starling (probably vagrants rather than breeders) and to a lesser degree by Indian Golden Oriole, but generally most characteristically South Asian species are absent. What is relatively clear from this overview of species' ranges is that the Wakhan is on or close to the edge of many species' ranges from all of the different identified biogeographical groupings present.

The three Wakhan regions have somewhat different bird communities (see Table 4), the lower main valleys, with their fields, plantations and riparian thickets host a number of species which require tree and shrub cover and are thus absent from the Pamirs (e.g. both pied woodpeckers, Indian Golden Oriole, Yellow-breasted Tit, Blyth's Reed-Warbler, Mountain Chiffchaff, Greenish Warbler, Hume's Whitethroat, Eurasian Jackdaw, Carrion Crow, Brown-necked Raven and Eurasian Magpie), also present are a number of open country species at the upper limits of their altitudinal range (e.g. Pied and Red-tailed Wheatears, Red-headed Bunting and Crimson-winged Finch), and a few species that appear to be dependent on agriculture (e.g. skylarks, Eurasian Tree Sparrow and Common Starling). This region of the Wakhan had in particular a predominance of western Central Asian and Middle Eastern species. Most of the breeding birds of higher altitude were either very scarce or absent in the main valleys, but also several

Palaearctic / Central Asian breeders (e.g. Horned Lark, Lesser Sand Plover and Isabelline Wheatear).

The central Wakhan valley had shared similarities with both adjacent regions, but was also somewhat different from both of them, particularly in two elements, firstly the presence of wooded valleys with riparian copses of willow and birch, and sparsely wooded slopes with juniper and rose. This woody cover supported a characteristic suite of species including two or more as yet unidentified leaf warbler spp. and Sulphur-bellied Leaf-Warbler. The second element was the presence and relative commonness of large rosefinches, including Spotted Great Rosefinch and possibly also Streaked Great Rosefinch, as well as a few other species including Rock Bunting, Plain Mountain-Finch and White-winged Snowfinch, and possibly Rosy Pipit.

The Little Pamir had relatively few species, characterised by primarily high altitude species (e.g. Brant's Mountain-Finch and White-winged Redstart) and characteristically 'northern Palaearctic' and Central Asian breeders, the majority of them wetland birds (e.g. Mallard, Ruddy Shelduck, Bar-headed Goose, Redshank, Horned Lark, Lesser Sand Plover and Isabelline Wheatear). Interestingly a number of species prevalent in the central Wakhan valley region, appeared localised to, or significantly more numerous in the western end of the Pamir. These included species likely dependent to some degree on some woody cover (lacking in most of the Pamir; e.g. Fire-fronted Serin), but also other species (notably Rosy Pipit, Black Redstart, Isabelline Wheatear, short-toed larks and White-winged Snowfinch) for which the reason for their restricted distribution was inexplicable.

Mountain slopes above all three valley regions may have relatively similar bird faunas. However the bird fauna of such habitat was only surveyed in the Little Pamir, with more cursory observations in the central Wakhan valley region. But, even within the Little Pamir there were noticeable location dependent differences in bird fauna, for instance snowcocks appeared greatly more prevalent in the northern mountains, while Snow Pigeons and Altai Accentors appeared to have the reverse distribution with higher numbers observed in the southern mountains. Such differences are presumably determined primarily by aridity, temperature and topography (geology), and thus vegetation type, but it is possible that human factors also play a part, as grazing pressure from domestic livestock is temporally and spatially patterned, with heavy use of northern mountains in winter and spring, and heavy use of the southern mountains in summer and autumn. Three high montane species Tibetan Snowcock, Tibetan Sandgrouse and Red-fronted Rosefinch which were found in the Northern and Southern Mountains may be restricted in distribution to the eastern 'high plateau-like' areas of the Wakhan, although this remains to be confirmed. Thus there are likely to be significant differences between the high montane (>3500m) bird communities in the different regions of the Wakhan.

The Wakhan in general has a relatively depauperate breeding bird fauna; depauperate not just in the number of species being low (an inevitable consequence of high aridity and high altitudes), but also in the numbers of birds present (e.g. the small numbers of most breeding waterfowl and the small numbers of pipits found), and most significantly seemingly depauperate compared with similar habitats within close by geographically similar areas. In particular there appears to be a conspicuous paucity of characteristically western Himalayan species (known for example from the Gilgit region of Pakistan ca. only 100 km away), especially

from the wooded areas of the main and central valleys (e.g. Tickell's Thrush *Turdus unicolor*, Spot-winged Tit *Parus melanolophus*, White-cheeked Tit *Aegithalos leucogenys*, White-cheeked Nuthatch *Sitta leucopsis* and Red-browed Finch *Callacanthis burtoni*). This presumably is likely to be largely attributable to the aridity of habitats and relative rarity of wooded habitats, due to the Hindu Kush and Karakoram ranges blocking moisture laden air from reaching the main and central Wakhan valley regions, as well as the dispersal barrier imposed by the Hindu Kush and Karakoram ranges themselves.

The Pamirs would appear to be ecologically similar to much of the Tibetan Plateau, in altitude, terrain and habitat (e.g. as characterised by example the Ladakh area of India; Pfister 2004), yet the Pamirs appear to lack many characteristically Tibetan Plateau species (e.g. Tibetan Partridge *Perdix hodgsoniae*, Snow Partridge *Lerwa lerwa*, Black-necked Crane *Grus nigricollis*, breeding gulls such as Brown-headed, Tibetan Lark *Melanocorypha maxima*, White-browed Tit-warbler *Leptopoecile sophiae*, Ground-tit *Pseudopodoces humilis* and various snowfinches). It may be due to ecological differences in climate and habitat, but also might be due (at least in part) to the isolation of the Pamirs from the main Tibetan Plateau by the high mountainous conjunction of the Tien Shan (Pamir Range), Kunlun and Karakoram ranges to the east of the Wakhan.

There appear to be fewer absences of western Central Asian species, although species such as Eversmann's Redstart *Phoenicurus erythronotus*, Songar Tit *Parus songarus*, Grey-necked Bunting *Emberiza buchanani* and Yellow-eyed Pigeon *Columba eversmanni* appear to be absent (or at least very scarce) as breeders, and the altitude of the Wakhan alone would not appear to be a primary factor (although perhaps a contributory factor) in their absence. The paucity of Middle Eastern and South Asian species in the Wakhan's bird fauna can largely be attributed to the lack of low elevation habitats; the whole of the Wakhan being well above 2500m in altitude. There is one other noteworthy species that the Wakhan appears to be missing, namely the endemic Afghan Snowfinch *Pyrgilauda theresae*, known from the high plateau areas of the Hindu Kush further south.

The depauperate bird community is thus probably in some measure a consequence of the geographical position of the Wakhan at an ecological crossroad of faunal regions; a sort of transitional zone at the margins of several faunal regions, in particular on the margin of both the highly distinct western Himalayan and Tibetan Plateau regions. As a transitional area, the ecological factors important in determining the distribution of bird species (such as climate and thus vegetation types) are not likely to be optimal in the Wakhan area for those (absent) distinctive species elements (listed above) that help define the biogeographical groupings in and adjacent to the Wakhan. In essence the Wakhan supports the generalist species from several biogeographical bird groupings, but generally lacks the specialist species from each.

3.2. Species accounts

This section provides detailed accounts of the status and threats to all the focal species in the Wakhan. Some other noteworthy species are also given detailed accounts.

Bar-headed Goose (Least Concern)

Small numbers were present on Chakmactin lake, with minimum counts of 10 on 11 June, 9 on 12 June and 9 birds on 21 June. Two birds observed on the 21 June appeared to be sitting on

nests on a tiny islet at the southwest end of the lake. All birds seen were very wary, suggesting persecution may be heavy.

Ayé (2007) speculated that the geese may breed in reasonable numbers, but this has clearly not been borne out. It seems unlikely that many more than the two suspected nesters breed in the Little Pamir. The total number of birds present in the Little Pamir at the time of the survey was likely to have been not much more than the minimum counts of ca. 10 birds. Surveys, in the breeding seasons of 2007 and 2008, of Ghaznikul and Zorkul Lakes in the Big Pamir have not detected the species breeding there (S. Ostrowski pers. comm. 2008), despite some observations of largish numbers during periods of presumed passage (Ayé 2007; NM pers. comm. 2008).

It is unclear of the numbers observed by Petocz (1978a), but this author stated the species to breed (p. 17) and also reported that local people collect their eggs whenever they are found (p. 17). These statements if true would suggest that numbers were once higher and that there has been a decline in the breeding population. It seems unlikely that the species will be found breeding elsewhere in Afghanistan, and thus in a National Context these breeding birds have high significance, however as a contribution to the global breeding population they are of no significance, with large breeding populations in other Himalayan areas and across the Tibetan plateau (e.g. Pfister 2004).

Other waterfowl (mainly Least Concern)

Common Mergansers were recorded both from the rivers of the lower main valleys and the wetlands of the Pamir, with breeding evidence found in both. The species was particularly common, although local, in the Little Pamir, where a number of congregations were found. Such congregation had higher ratios of males to females suggesting females were still nesting. However, only one female was actually seen with young. The numbers of birds in the Little Pamir is likely relatively high (day minimums all from different areas of the Pamir: 39 & 8: 11 June, 13+: 12 June, 10+: 16 June, 65+: 21 June), with probably a minimum of 200-400 birds present.

Ruddy Shelducks were only observed in the Little Pamir, where pairs were found widely, associated with the wetlands and occasionally away from wetlands in alpine heath and steppe. The numbers of birds in the Pamir is likely relatively high with probably a minimum of 115 birds observed during the survey (day minimums all from different areas of the Pamir: 9: 10 June, 19: 11 June, 19 & 32: 12 June, 4: 14 June, 26+: 16 June, 6: 21 June). Evidence of breeding in the form of adults with young was found on only two occasions. As most observations were of presumed breeding pairs which appeared not to be associated with nests or young, it seems likely that most had failed to breed. Egg fragments of unhatched eggs found on one small islet were probably of this species.

A number of other duck species were observed associated with the Chakmactin wetlands, these included (numbers in parentheses are minimums recorded) Northern Pintail (37+), Northern Shoveler (23+), Gadwall (17), Mallard (5), Common Teal (9+), Garganey (8), Eurasian Wigeon (9), Common Pochard (6), Tufted Duck (2), [Ferruginous Duck (Near-threatened) (1)]. Two duck nests were found, one at least appeared to be that of a Mallard. A few Common Teal and

probably either Mallard or Gadwall were also found associated with the rivers of the lower main valleys.

Coots were common on Chakmactin Lake, mainly forming large aggregations, and one nest was found. A few coots were also seen in the lower main valleys.

Breeding populations of some of these species might be significant in a national context, especially those of Common Merganser and Ruddy Shelduck, but none have significance globally. Although numbers of Common Mergansers have been used in the justification of 'Important Bird Area' status of parts of the Wakhan, this is questionable given the likely uncertainties in the regional population numbers of the species, and especially dubious if the comparison were made with primarily Middle Eastern areas, rather than Greater Himalayan and Central Asian sites.

Black Kite and Black-eared Kite (Least Concern)

No kites were seen in the field during the survey, however, an injured bird was seen in the possession of the owner of the guesthouse in Ishkashim where the team stayed.

These two species, often considered conspecific and hard to separate, could and may occur as summer breeding visitors to the area (see Roberts 1991, Rasmussen and Anderton 2005, Pfister 2004). Neither Petocz (1978a) nor a translation of Argandeval (1983) records the species, however Dr. Stoliczka collected an adult (species not determined) at "Panjah" on the 26 April 1874 (Sharpe 1891). It is not clear if Ayé (2007) recorded either species, although that author considered them only passage migrants in the Wakhan. Sayer and van der Zon (1981), state that the 'Black Kite' *sensu lato* breeds up to 3000m, is "rather common" (p. 24) and "recorded throughout" (p. 39) Afghanistan; however earlier Whistler (1945; p. 300) was more cautious in his assessment and reserved judgment on their country wide status. This assessment is similar to that of neighbouring countries where the term 'abundant' is often used to describe their status (Rasmussen and Anderton 2005, Roberts 1991). No birds were seen on either of the two journeys between Ishkashim and Fayzabad, which seems surprising, given the above regional statements of widespread commonness. But Paludan did not record 'Black Kites' in the Waduj valley, although he did find them elsewhere in Badakshan, with at least one breeding observation, but only below 1,600 m (Paludan 1959). Evidence for any change in status is thus somewhat equivocal, but it might prove interesting to review recent and historical literature for other areas of Afghanistan. In Southeast Asia there have been serious declines in populations (resident and migrant) of both species.

Pallas's Fish-eagle (Globally Threatened – Vulnerable)

A single bird was seen perched on a small islet in a braided river channel of the Chakmactin river east of Chakmactin Lake on the 12 June.

A translation of Argandeval (1983) records the species as a common breeding bird of the 'Pamir'. Clearly this is not so at present, which either indicates a severe decline, or perhaps that Argandeval (1983) was drawing upon studies that also included the Pamir Mountain Range of what is now Tajikistan, or perhaps that the data are otherwise erroneous (see below). No other authors traced have reported the species. It seems most likely that the bird seen was a vagrant, or perhaps a passage migrant.

Bearded Vulture (Least Concern)

This was the most widespread of the vultures observed, with records from all three survey regions. Observations were as follows: a single between Ishkashim and Khandud on the 31 May; in the central Wakhan valley two sightings of a single and two on the 7 June and a single on the 24 June; seen on all but one of the days in the Southern and Northern Mountains, where one to three encounters were recorded each day, involving both adults and subadults; and on the 23 June a single subadult over the lower slopes at the far western end of the Little Pamir. As with Himalayan Vulture there were no records of this species over the valley floor of the Pamir.

Petocz (1978a) lists the species for both Pamirs and the Wakhan valley and said that this species “occurs commonly throughout the Pamir”, a statement that could perhaps be still justified today, although ‘localised’ rather than ‘throughout’ might be a better description, and might perhaps be an indication of downward trends. However, a translation of Argandeval (1983) records the species as a rare breeding resident of the ‘Pamir’. UNEP & FAO (2003) report the species as “One or sometimes a pair seen almost every day while we were in the Big Pamir and also in the Little Pamir, upper Wakhan Valley on the [Dalys] Pass”. Similarly in summer 2006 Ostrowski (2006) recorded singles of the species “daily” over the southern valleys extending from the Big Pamir and in autumn 2006 Ostrowski (2007) recorded up to three birds “daily” in the lower main valleys. Habib (2007) recorded the species only once over the lower main valleys, but this surveyor’s birds observations were only incidental.

Egyptian Vulture (Globally Threatened – Endangered)

The species was only observed in the lower main valleys. Singles were observed as follows: 30 May: subadult up from fields in Ishkashim; 2 June: subadult low over pasture at Gaz Khan;

The species may be naturally scarce in the area due to the high elevations of most of the survey area, for example in the presumably somewhat similar terrain and high altitudes of Ladakh the species is considered only a rare passage migrant (Pfister 2004). But, Petocz (1978a) lists the species for both Pamirs and the Wakhan valley and considered it to have the same ‘abundance’ to Bearded Vulture which was said to “occurs commonly throughout the Pamir”. This statement if true might indicate a considerable decline. However, a translation of Argandeval (1983) records the species as a rare passage migrant of the ‘Pamir’. In September 2007 Ayé (2007) only recorded small numbers on two days in the Panj valley at Gaz Khan and further west, and Ostrowski (2006) saw only singles to the west of Qala-i-Panj in summer 2006, suggesting a similar status to that found during the current survey. Sayer and van der Zon (1981) record the species as a “common summer visitor and breeding throughout Afghanistan, except for the highest parts”. It is certainly questionable whether this is true today. Despite the conservation status of the species, the population appears to be so small (and perhaps not resident) that it is unlikely to be significant even nationally.

Himalayan Vulture (Least Concern)

The species was only observed on and over the Little Pamir slopes of the Southern and Northern Mountains. Birds were not seen to cross the Little Pamir. On each of three of the four days in the Northern Mountains there were several encounters involving a minimum of two birds, and in aggregate amounting to a minimum of at least two adults and a sub-adult. There was a single sighting of a subadult in the Southern Mountains. A dead griffon, presumably this species was found besides the Chakmactin river. The carcass had largely been picked clean

presumably by scavengers, and the skeleton was remarkably undamaged save for the wings which had been cleanly snapped off across the humeri.

The lack of records elsewhere seems surprising, and may be evidence of a downward trend especially as Petocz (1978a) lists the species for both Pamirs and the Wakhan valley and considered it to have the same 'abundance' to Bearded Vulture which was said to "occurs commonly throughout the Pamir". But, the 'apparent status' of vultures can be influenced very significantly by food availability, especially the large species which are capable of covering great distances in search of food. However, in September 2007 Ayé (2007) only recorded the species twice on the same day in the mountains south of the Big Pamir, and on several occasions on three of six days spent in the Sarhad area of the lower main valleys region; again suggestive of small localised numbers. In summer 2006 Ostrowski (2006) saw the species only once, a single individual, and again in autumn 2006 Ostrowski (2007) saw the species only once, but recorded a total of six over the lower Wakhan valley (further west than Ayé's (2007) observations). A translation of Argandeval (1983) records the species as a common passage bird of the 'Pamir'; a statement that would appear to be erroneous as it is more likely that the species is either a resident or summer breeding visitor. UNEP & FAO (2003) appear to have only encountered griffon vultures once when six birds (species identity uncertain) were seen above the Dalys pass. Sayer and van der Zon (1981) record the very similar Griffon Vulture *Gyps fulvus*, which might be expected to occur in the lower main valleys, and also for which Himalayan Vulture might be confused, as "common throughout the country". It is certainly questionable whether griffon vultures (of either species) remain either widespread or common in Afghanistan.

Although the cause of death, of the dead bird that was found, cannot be determined with certainty, the fact that the wings were completely broken off the body is cause to speculate human involvement. The species is one of the less threatened vulture, presumably largely due to its relatively large global range in generally inhospitable montane areas of the Himalayas and Central Asia, where persecution levels are relatively low and the use of the veterinary drug diclofenac is minimal at best.

[Saker Falcon (Globally Threatened - Endangered)]

Possible records on 30 & 31 May and 30 June in the Ishkashim area. The bird(s) seen seemed relatively small, similar to a small nominate race Peregrine, but with obviously brown (warm) upperparts, slimmer longer-tailed appearance and longer wings, and relatively pale underparts (seemingly ruling out juvenile and immature Laggar Falcon *F. jugger*). Altitude and terrain would also be more characteristic of Saker than Laggar Falcon. A bird seen on the 22 June in the Northern Mountains of the Little Pamir may also have been a Saker, the bird whose upperparts were not seen clearly had probably brownish upperparts, with noticeably pale dorsal sides to the uppertail coverts/rump region, a rather messy moustacial lobe on a mainly pale face, and finely barred underwings and underparts which were not strongly coloured. The size appeared similar to, or smaller than, a male nominate Peregrine, with a similar type of build to this race of Peregrine.

There was a general paucity of 'large' falcons seen during the survey (see below), somewhat of a surprise, although perhaps reflecting the arid high altitude conditions and generally low prey-densities. A translation of Argandeval (1983) records the species as a common breeding bird of the 'Pamir'. Clearly this is not so at present, which either indicates a severe decline, or perhaps

that Argandeval (1983) was drawing upon studies that also included the Pamir Mountain Range of what is now Tajikistan, or perhaps that the data are otherwise erroneous (see below). Petocz (1978a) lists the species for only the Little Pamir, however this author lists two other rather unlikely species (Gryfalcon *Falco rusticolus* and Laggar Falcon *F. jugger*) but did not record the next species detailed below. Ostrowski (2007) recorded a juvenile Saker in the Qala-i-Panj area. Habibi (2007) reports a bird in mid April 2007, but provides no other details. Ayé (2007) did not find the species although one or more juveniles of the following species were seen.]

Peregrine Falcon (Least Concern)

A bird observed hunting passerines over fields in the Qazi Deh area, on the afternoon of the 30 June appeared to be a subadult of this species.

The taxonomy of Peregrines is complex, with several forms described, and with a primarily Africa species Barbary Falcon *F. pelegrinoides* now generally recognised as a distinct species from the widespread 'Peregrine Falcon'. However there are differences in opinion of assignment of various races between Barbary and Peregrine Falcons. For instance Ferguson-Lees and Christie (2001) treats the race '*babylonicus*' as conspecific with Barbary while Rasmussen and Anderton (2005) treat the same taxon as conspecific with Peregrine. The bird seen in the Qazi Deh area had a dark crown and upper face and prominent long moustacial lobe, darker than the nape and mantle, and a contrastingly pale forecrown. The upperparts, including upperwings, were greyish, grading to very dark primaries, while the mantle and back graded to a pale greyish rump. The tail was grey and finely barred. The underwing was finely and densely barred, while the underbody was heavily streaked with very dark streaks, with possibly a somewhat brown washed vent and undertail coverts. Legs were yellowish. Plumage characters, especially of the head, seem to be somewhat intermediate between the regionally recognised races '*peregrinator*' (southern) / '*peregrinus*' (northern) (both dark crown) and '*babylonicus*' (rufous/brown crown, paler forecrown). Build and structure were rather different from nominate (*peregrinus*) race of Peregrine, being smaller, slimmer and longer-winged.

The species has a very large global range and the Wakhan is unlikely to be of conservation significance for the species.

Other raptors

In addition to the species already covered above, only the Golden Eagle (Least Concern) was found with any consistency. This latter species was only recorded on four days in the central Wakhan valley region and found commonly associated with the Northern and Southern Mountains of the Little Pamir. But, no birds were seen over the valley floor of the Little Pamir, nor over the lower main valley region. The only other raptors observed during the survey were a male Common Kestrel (Least Concern) on the 6 June in the Sarhad area and probably this species once around the wooded Vorsgitch valley in the central Wakhan valley region, and twice smallish unidentifiable falcons in the Northern Mountains above the Little Pamir.

Common Kestrel has been reported by others; e.g. Petocz (1978a) lists the species for both Pamirs and the Wakhan valley, and a translation of Argandeval (1983) list it as a vagrant to the 'Pamir', UNEP & FAO (2003) write "Observed almost daily. Ubiquitous." Sharpe (1891), writing of Col. Biddulph, says "he did not notice it on the Pamir, but procured it again down in Wakhan". Ostrowski (2006) recorded small numbers and suggested that the species bred in the Wakhan.

The species may be much more common during passage and during winter, which would help to explain some of the contradiction of the current survey results with those of some of the past authors.

Several authors have reported Lesser Kestrel *Falco naumanni* (Globally Threatened – Vulnerable), including Ayé (2007) who recorded a single bird in the Sarhad area. Petocz (1978a) stated that this species “can frequently be observed in hunting groups of 3 to 5 birds”. A translation of Argandeval (1983) records the species as a rare breeding bird of the ‘Pamir’. However, the same translation of Argandeval (1983) records Golden Eagle as only a vagrant to the ‘Pamir’; a clearly erroneous statement, which puts into doubt the validity of other data presented. Petocz (1978a) appears to confuse Steppe Eagle *Aquila nipalensis* with Golden Eagle, which similarly makes other data of this author questionable.

Records of other raptor species (Petocz 1978a, Argandeval 1983, UNEP & FAO 2003, Ostrowski 2006, 2007), none in large numbers, are likely of passage migrants, winter visitors and or vagrants (Ayé 2007; RJT pers. obs.). The general paucity of ‘summering’ raptors recorded by the current survey, especially in the lower main valleys, seems surprising and might be reflective of worrying trends.

Himalayan and Tibetan Snowcock (Least Concern)

Himalayan Snowcocks were confirmed calling on the 7 June on craggy and scree dominated slopes, at 4000+ m, in the central Wakhan valley section; during that day calls (all in the morning) were noted originating from at least nine locations, all seemingly above 3900 m, but below ca. 4300 m, from predominantly scree and crag covered steep slopes. Thereafter what was presumed to be this species was heard on the 8 June: 2+ above Baharak; 9 June: 2 east of Langar; 20 June: [single distantly] in the Southern Mountains; 23 June: calls heard very distantly (in the afternoon) while on the western most slopes of the Pamir, above Gormatuk; and 28 June: heard from two locations in the afternoon west of the Shauwer valley. Prior to this, distant (directionless) calls heard and recorded from the valley floor in the Gaz Khan area were presumed to have been this species. The paucity of records on the return journey through the central Wakhan valley may have been partly an artefact of many morning hours being spent in the vicinity of noisy streams, however there did appear to be a distinct difference between number of calls heard west of Baharak and east of Baharak, although the reason for this is difficult to explain. Likewise there was certainly hardly any calling activity on the slopes surrounding the Little Pamir.

Tibetan Snowcock was recorded on 22 June above ca. 4600 m, when two birds were flushed, and a short while later when a female with at least 6-7 chicks was found. Snowcocks, not identified to species, were seen briefly flying across the Tasserie valley in the Northern Mountains on the 15 June at ca. 4800 m (NM). Presumed snowcock droppings (the majority of them old) were found generally abundantly on all upper slope areas of the Northern Mountains surveyed, especially around crags and scree slopes with vegetation. In contrast dropping were very much scarcer in otherwise similar habitats in the Pamir slopes of the Southern Mountains.

Previous records of Himalayan (some of which might in fact refer to Tibetan) suggest the species is probably widespread in the Wakhan (Petocz 1978a, UNEP & FAO 2003, Habib 2007, Ayé 2007, NM pers. comm. 2008, B. Habib pers. comm. 2008), especially as previous survey-work has likely been rather limited in the species apparently preferred high scree and crag

covered slope habitat. Both species' patterns of distribution may change when not breeding, especially in winter, when aggregations are likely to form (Pfister 2004, Roberts 1991). Despite the discrepancies in abundance between some of the survey sites, there seems little cause for concern, although it might be useful to monitor distribution, especially of calling birds and perhaps also winter aggregations, to determine if there are significant spatial distribution patterns.

The above records appear to be the first records of the Tibetan Snowcock from the Wakhan or for that matter Afghanistan. There appears to be no detectable difference with historical records in the status of Himalayan Snowcock in the Wakhan, and both species have relatively wide global ranges, where threats are probably minimal. Himalayan Snowcock appears to have a wide range in Afghanistan (Sayer and van der Zon 1981), and even the Tibetan Snowcock may be more widespread, as high plateau areas of the Hindu Kush have been little surveyed. The Wakhan population of neither species is globally significant, and even in a national context there seems no reason to assume that the Wakhan has a particularly significant population of Himalayan.

Chukar Partridge (Least Concern)

Chukar were recorded sporadically in the lower main valleys and the central Wakhan valley (probably common but only a few contacts per day), but not in the Little Pamir or adjacent mountains. It is hard to determine status, as the species is secretive and it is not clear if birds were particularly vocal during the survey period. The calls that were heard were generally in the early morning. Such calling was never suspected to be from more than a couple of groups at any of the central Wakhan campsites (but at three of the six sites river noise and topography probably confounded the numbers recorded). In the lower main valleys the species was only recorded once in an area of riparian thicket.

There perhaps has been a decline in the species, although the species may be significantly easier to observe during the autumn and winter, especially after the harvest in the lower main valleys. But, Col. Biddulph wrote, for April 1874, "in the valley between Panjah and Sarad [sic] in Wakhan they are specially abundant, and people hawk them." (Sharpe 1891). Petocz (1978a) lists the species for both Pamirs and the Wakhan valley. UNEP & FAO (2003) considered that Chukar and other small game were hunted, but assessed the abundance of Chukar during September and October 2002 as "Very common, and big coveys of 20+ birds. Commonly seen and often heard... Ubiquitous to all mountain areas." Ostrowski (2007) also also considered the species "a common 'game' species in Wakhan. Often heard and encountered in flocks exceeding 10 birds"; a very similar assessment also being made by Ostrowski (2006) for an area including the Big Pamir. Habib (2007) came across the species relatively frequently in April in the lower main valleys, suggesting that also in the spring, prior to the start of nesting, the species is relatively easy to observe and that the current survey coincided with breeding when the species is least visible. Sayer and van der Zon (1981), writing of the species in Afghanistan in general, note the species as occurring "in high alpine valleys up to 4 500 m".

Common Quail (Least Concern)

The only record was of a bird heard and seen in fields at Sarhad by NM on the 28 June.

Ayé (2007) lists the species, considering it a passage migrant, no other authors appear to have recorded the species.

Ibisbill (Least Concern)

There were focused surveys for the species in all survey regions, covering the main Panj river to small high montane streams, amounting in total to likely several days survey effort. The species if present as a breeder would appear to be scarce and or localised. Previous records of the species (Ostrowski 2007; NM pers. comm. 2008), may have been of non-breeding winter visitors. The species has a relatively wide global distribution, primarily using rivers that are, relative to the majority of riverine habitats, both within Afghanistan and globally, little threatened by human activities. The Wakhan is likely on the edge of the species global distribution, and as with Pakistan where the species has been considered a 'vagrant' (Roberts 1991) the population is likely 'marginal' and of no global significance.

Gulls and Terns (Least Concern)

Three species of gull and two of terns were recorded around Chakmactin and other wetlands in the Little Pamir. Brown-headed Gull was the commonest of the gulls, followed by Great Black-headed Gull, both of which probably numbered in the low tens for the area surveyed. There were also smaller numbers of Common Black-headed Gulls present. No evidence of breeding was found for the gulls, and no adults in breeding plumage were observed. Despite speculation to the contrary (Ayé 2007), there is no evidence from the Big Pamir either, that any species breed (NM & S. Ostrowski pers. comm. 2008). Thus although, the Wakhan may support relatively high gull numbers during periods of passage (Ayé 2007), the areas national significance for gulls is not especially high.

Two gull-billed Terns were observed on 10 June over Chakmactin and Common Terns were observed daily. Common Terns were found, and suspected to be, breeding on several islands / islets and the surveyed areas breeding population is likely somewhere between 30 and 75 pairs, with at least one concentration of ca. ten or more pairs found on a single islet. Although the Wakhan has no significance globally for Common Terns, nationally it may be of some significance.

Tibetan Sandgrouse (Least Concern)

The species was recorded only on the 14 June in the Northern Mountains at ca. 4800-4900 m, when first a group of 15+ birds were seen in flight, then later a male and female were flushed from a slope, and later still a group of nine birds were found feeding (all in a relatively small area and presumably involving the same group of birds).

Petocz (1978a) reported Pallas's Sandgrouse *Syrrhaptes paradoxus* for the Little Pamir. Ostrowski (2006) reported sightings of Pallas's Sandgrouse on two occasions, however that author did not see the birds personally and it would be easy for an inexperienced birder to confuse Tibetan and Pallas's Sandgrouse even in flight.

The above records appear to be the first records of the Tibetan Sandgrouse from the Wakhan or for that matter Afghanistan. However, the Tibetan Sandgrouse may be more widespread, as high plateau areas of the Hindu Kush have been little surveyed. There appear to be no other records of Pallas's Sandgrouse for Afghanistan.

The scatter of records is hard to explain, as is an assessment of the species status; monitoring the species occurrence might be worthwhile.

Snow Pigeon (Least Concern)

Snow Pigeons were first seen on the 6 June when at least ten birds were found associated with a small wooded valley east of Sarhad. The following day ca. 17 were seen with ca. 5 Hill Pigeons using and flying around fields and adjacent alpine steppe in the Sarhad area. Otherwise Snow Pigeons were only seen in the central Wakhan valley region (birds seen most days, but never more than six encounters per day and maximum observed group size of five+, usually smaller), and in the vicinity of all three streams surveyed in the Southern Mountains (observed along one stream only by NM), where the highest count was between 7 and 12 birds on the 18 June.

Although one of the records of Snow Pigeon was of a group associated with Hill Pigeons, the remainder of encounters were of single species groups. The records from the survey were of birds primarily in the vicinity of rivers towards the bottom of valleys (several records of birds apparently feeding on the ground), or of birds perched on, or flying around, cliffs; there were no records of birds on the ground on slopes high above the valley bottom. The absence of sightings of the species from the Northern Mountains seems surprising and presumably is habitat related (there are cliffs), perhaps either due to the greater aridity (hard to imagine since meadows are present along the streams and at high altitude) or perhaps because of some effect of intensive winter livestock grazing.

There have been relatively few previous records from the Wakhan (Habib 2007, UNEP & FAO 2003, Petocz 1978a, Ayé 2007), leading to Ayé (2007) to suggest a need for detailed information on the species distribution. The current records and the anecdotal prior records suggest the species is confined in summer to high altitude areas as would be expected (Rasmussen and Anderton 2005, Grimmett *et al.* 1998, Pfister 2004), seemingly particularly in the vicinity of rivers and streams probably that also have cliffs and crags close by. However, it may descend lower in winter to the main lower river valleys. The paucity of records from valleys south of the Big Pamir (e.g. Ostrowski 2006; Ayé 2007) is like the species absence or scarcity in the Northern Mountains hard to explain, but could perhaps indicate a sensitivity to unknown habitat factors. The latter possibility suggests that monitoring the species occurrence might be worthwhile.

The species quite likely has a relatively large range in Afghanistan, *albeit* largely outside of previously surveyed areas, and there seems no reason to assume that the Wakhan has a particularly significant population. Although the species global range is not especially large it appears to be in no significant decline and has been noted as 'common' in much of its Himalayan range (Rasmussen and Anderton 2005, Grimmett *et al.* 1998). The species may be ecologically relatively more scarce in the arid highlands of Afghanistan than in some other parts of its global distribution, for example in Ladakh the species has been assessed as commoner in the moister western parts of the region (Pfister 2004). A similar assessment of greater abundance in moister regions has been made for Pakistan by Roberts (1991); leading one to speculate that the Wakhan and similar arid high altitude habitats favour Hill Pigeon rather than Snow Pigeon, helping to explain the species apparent preference for river valleys, and suggesting that Afghan populations of Snow Pigeon would be most significant on the eastern slopes of the Hindu Kush.

Hill Pigeon and Rock Pigeon (Least Concern)

In the lower main valleys both species were common to abundant, although somewhat local and associated primarily with agricultural lands, usually seen in mixed flocks of up to 20+ birds. On

the 29 June for instance a minimum of 36 Hill, 43 Rock and 30 pigeons not identified to species were seen while driving between Sarhad and Ishkashim (birds were hard to detect on fields while driving), and on 1 June in the Qala-i-Panj area ca. 70+ Hill Pigeons and ca. 35+ Rock Pigeons were seen in loosely associated groups on and flying over fields (the prior afternoon in the same area only small numbers of pigeons had been seen). The ratio of Rock to Hill Pigeon appeared to increase towards Ishkashim, with for example only Rock Pigeons found around Ishkashim on the 30 June and 1 July, and only Hill Pigeons confirmed in the Sarhad area. In the Gaz Khan area there was a suggestion that small numbers of Rock Pigeons were nesting on the cliffs above the valley (also noted by Ostrowski 2006). Rock Pigeons were not recorded from the Little Pamir or the central Wakhan valley. Small numbers, never more than eight together (and never more than ca. five encounters per day), of Hill Pigeon were seen on most days in the central Wakhan valley, but the only record from the Little Pamir was of eight birds, presumed to be this species, flying on the 16 June in the area furthest west surveyed.

Elsewhere the two species are somewhat altitudinally separated, with Hill Pigeon generally occurring at higher elevations. In Afghanistan as well as both Pakistan and Ladakh Hill Pigeon has been surmised to be commonest in the more arid regions (somewhat less common in less arid areas) (Paludan 1959, Roberts 1991, Pfister 2004).

The Rock Pigeons reported above, although somewhat variable in plumage features, especially paleness of rump, appeared to be of truly wild origin. There were no sightings of feral 'Domestic' Rock Pigeons, and although 'Domestic' Rock Pigeons are undoubtedly kept in Badakhshan, none were seen in the Wakhan. There appears to be no detectable difference with historical records in the status of either Hill or Rock Pigeon. Both species have relatively wide global ranges, and globally are not at risk (e.g. Pfister 2004; both species common residents of Ladakh), however locally, as for instance in Kazakhstan, Hill Pigeon is reportedly in decline (Wassink and Oreel 2007). Both species are likely still widespread in Afghanistan, and the Wakhan populations are not likely to be of great significance.

Himalayan and White-winged Pied Woodpeckers (Least Concern)

Himalayan Pied Woodpeckers were recorded on the 30 June and 1 July in the Ishkashim area, both occasions being in the same wood plantation patch, and involving at least two birds. White-winged Pied Woodpeckers were also recorded on the 30 June and 1 July in the Ishkashim area and involved at least two and probably more likely three separate groups of birds. Unidentified pied woodpeckers were also observed at one other location in the Ishkashim area on the 30 June and on the 1 June in the Qala-i-Panj area birds were seen twice and heard once.

Ayé (2007) recorded an unidentified pied woodpecker on one occasion and raised the possibility of presence of White-winged Pied Woodpecker. Ostrowski (2007, 2006) each recorded Himalayan Pied Woodpecker on one occasion. There are a scatter of pied woodpeckers records from other areas of Afghanistan (e.g. Sayer and van der Zon 1981, Paludan 1959).

Pied woodpeckers are clearly limited in range and numbers by the extent of woody habitat, itself under the control of humans, current plantation schemes are likely to benefit these species. These species may also occur in the small wooded valleys away from permanent human habitation, however there was no evidence of presence in such habitat during the surveys, and

the area of such habitat is relatively insignificant in comparison to the plantations of the main Wakhan and Panj valleys. Populations of both species in the Wakhan area are of no global significance, and unlikely to be of significance even in a national context.

The two species are very similar in appearance, especially as the throat, breast, flanks and belly of Himalayan Pied Woodpecker are white or almost white. The best distinguishing features to separate the two species appeared to be the location of red on the head, the large white neck patches of Himalayan that almost join across the bottom of the nape and are separated from the white face by a narrow black bar (much smaller white patches in White-winged with much broader separation), the off-white to rufous, rather than white, fore crown of Himalayan, and a dark smudged area around the eye of Himalayan, rather than the neater partial inclusion of the eye by black lobes from the crown in White-winged.

Scaly-bellied Woodpecker (Least Concern)

No evidence of the species was found during the survey, despite focused surveys of presumed suitable habitat. The species has been observed on previous occasions (Ostrowski 2006) suggesting that it is scarce and or localised in the Wakhan. Relatively numerous records from other areas of Afghanistan (Sayer and van der Zon 1981) suggest that the Wakhan is relatively marginal to its main distribution.

Mountain Chiffchaff (Least Concern)

The species was common to abundant in riparian thicket of the lower main valleys (but scarce or absent from willow and poplar plantations). The numbers of birds present was relatively high with for example ca. 19 recorded along a ca. 2,100 m 'transect' through riparian thicket on 31 May; 9 in ca 650 m on 1 June and 40 in ca. 1,900 m on 3 June. Abundance in the central Wakhan valley was lower, although birds were still widely recorded in riparian patches of trees and shrubs along the main Wakhan river and in the birch and willow thickets of this area, but for instance only about four singing birds were recorded for ca. 1,600 m of birch-willow thicket in the Shauwer valley on the 28 June, and less than ten singing birds were estimated for the ca. four hectares of birch-willow thicket in the Vorsgitch valley. However, given the relative rarity and small absolute area of suitable vegetation for the species, the Wakhan population cannot be huge.

The species global range (dependent somewhat on taxonomy) is relatively small, however the species is likely to be common and widespread in many areas of this range, including the river valleys of northern Afghanistan, and the forested mountains of the east. For example in the Ladakh region of India the species has been considered 'one of the most common species throughout the lower regions' (Pfister 2004). The Wakhan population is unlikely to be of even national significance for the species.

Olive leaf-warbler spp. (Least Concern)

Two or more species of olive leaf-warblers, with wingbars, appear to be probable breeders (one confirmed) in the willow and birch thickets of the central Wakhan valley, at least two of them being assessed as common and found in all four of the side valleys with such habitat, that was surveyed reasonably thoroughly during the survey. Densities of one species were relatively high with perhaps 20+ calling birds in the ca. four hectares of birch-willow thicket in the Vorsgitch valley.

Tape recordings were made of the songs and calls of these birds, and analysis by specialists is underway. There are a number of species of olive leaf-warblers with relatively small breeding ranges centred on the western Himalayas (e.g. Brooks's Leaf-Warbler *Phylloscopus subviridis*), it is possible that the Wakhan avifauna may include one or more of these species; one has been provisionally identified as Hume's Leaf-Warbler (probably the second commonest species). However, the limited area of suitable habitat in the Wakhan, coupled with the likely greater extent of suitable habitat in eastern Afghanistan, would suggest that Wakhan populations of these species (if indeed they even occur) are unlikely to be even of national significance.

[Streaked Great Rosefinch (Least Concern)]

A male and female observed at c. 3900 m in the Dalys Pass area (central Wakhan valley region) on the 7 June, and a female seen a little earlier in the same area (ca. 4100 m), appeared to show features more in character with this species than Spotted Great Rosefinch. The differences between this species and Spotted Great Rosefinch are quite subtle, and not well elucidated in current field guides, but the dark bills of both sexes, the distinct streaking of the female, and fine spotting of the red, and no strong contrast between the red of the head and the brown upperparts of the male are more characteristic of Streaked Great Rosefinch. These were however the observers first ever observations of large rosefinches and viewing conditions were not ideal, they are thus treated as provisional pending more fieldwork. Ostrowski (2007) also reported the species based on observations in autumn 2006. These would appear to constitute the first records of the species from Afghanistan.]

Spotted Great Rosefinch (Least Concern)

All records came from the central Wakhan valley region and were as follows. A male probably of this species was seen in a region of transition between rocky lower slope and flattish 'rock-less' plain on the 24 June at ca. 3800 m, on 25 June a male and female were found on the rocky gorge sides of the Utchorromgash valley (> 3800 m), and later the same day a male and two females were watched feeding in a gravely vegetated stream channel and in adjacent alpine heath at ca. 4000 m, on the 27 June a male and two females were seen in alpine heath (ca. >3500 m), and on the 28 June a male and female were found feeding in alpine heath at ca. 4000 m, close to the location of the potential record of the previous species. Additionally, in this same area on the same day, groups (possibly the same) of two, three plus and two, large rosefinches were seen in flight and flushed from the slope.

None of the observations were ideal and on none of the occasions listed above were all potentially characteristic features seen. Individually the records might best be treated as provisional, however the combined evidence of all observations taking into account the range of characteristics observed, including yellowish-horn bills in both sexes, noticeably paler rumps and noticeably contrasting head and upperpart darkness in males, and none or very indistinct streaking of upperparts in females, confirms that this species is present in the area. However the number of birds seen that could not even be tentatively allocated to species (see below), and the possible presence of Streaked Great Rosefinch (see above) make it difficult to determine the species status or habitat preferences in the survey area.

Red-fronted Rosefinch (Least Concern)

A group of five birds including a presumed male, female and possibly three juveniles were observed on the gentle, bottom slope of the Southern Mountains on 20 June feeding in stony alpine heath at ca. 4300 m. Five large finches seen in flight less than 500 m away, somewhat earlier, were presumably the same birds.

The above records appear to be the first records of Red-fronted Rosefinches from the Wakhan or for that matter Afghanistan. The species may be more widespread, as high plateau areas of the Hindu Kush have been little surveyed.

Large rosefinches not identified to species

In the central Wakhan valley region one or more was observed on 7 June around juniper crags (ca. > 3900m), a male and female was seen on 8 June in riparian trees and bushes along the Wakhan river (ca. 3300 m), a single was found on 9 June in Alpine heath (ca. 3900m), on 24 June a bird was seen between Langar and Utchorromgash (ca. 3700 m), a male and female were observed on the 27 June on the edge of the shallow Wakhan gorge in an area with sparse rose and juniper at ca. 3500 m, later the same day in an area of alpine steppe, again on the edge of the shallow Wakhan gorge, a male and female plus another bird were seen at ca. 3400 m. On the 28 June one plus bird(s), and then two were seen in areas of juniper and rose, with surrounding crags in the Shauwer valley (ca. 3500-3600 m), later that day there were several records further west (see Spotted Great Rosefinch). The only records of unidentified large rosefinches away from central Wakhan valley were on the 22 June when one, but probably more likely two or more birds were observed in an area of crags, scree and alpine heath at ca. 4600m in the Northern Mountains, and a male was also seen by NM in a gravelly river bed at ca. > 4800 m on the 15 June, also in the Northern Mountains.

All three of the large rosefinch species listed above are apparently characteristic of high altitude terrain, primarily at or above the treeline, Red-fronted in particular is noted by several authors as being characteristic of the highest limits of vegetation (Rasmussen and Anderton 2005, Grimmett *et al.* 1998, Clement *et al.* 1993) which certainly fits with the observations from the Little Pamir. Information on the preferences of Streaked and Spotted Great is somewhat confusing, but Rasmussen and Anderton (2005) state that the former “breeds in dense scrub and low willows”, while the latter “breeds above the treeline in most barren rocky areas”; the central Wakhan valley would appear to offer both habitat types. The paucity of large rosefinches in the area of the Little Pamir, especially on the adjacent slopes of the Northern and Southern mountains was somewhat surprising, especially as the predominant difference with the central Wakhan valley region was only a lack of trees and shrubs in the Little Pamir. This difference does seem to be suggestive of a need for some tree and shrub cover in optimal terrain for Spotted Great and potentially Streaked Great Rosefinches at least in the Wakhan. Spotted Great Rosefinch is likely widespread in Afghanistan, judging by the scatter of recent and historical records (Sayer and van der Zon 1981, Ayé and Busuttil in prep.) and the abundance of suitable high terrain throughout the Hindu Kush, and thus the Wakhan population is unlikely to be very significant even nationally. Red-fronted Rosefinch may be relatively restricted in range nationally, seemingly being a species of the high montane alpine zone, but given the paucity of surveys of the high plateau areas of the Hindu Kush above 4000 m, this species may occur more widely.

3.3. Large Mammals

In addition to the ubiquitous Long-tailed Marmots *Marmota caudata*, frequent sightings of hares *Lepus* and occasional observations of pikas *Ochotona*, a number of other species were observed. Records of these are detailed below. Most literature lists only Cape Hare *Lepus capensis* for the Wakhan, but it is possible that another species may be present in addition, however hare taxonomy is confusing and variously in need of revision. There also may be more than one pika species present, as observations during the survey suggested two morphs were present differing most noticeably in ear size.

Grey Wolf *canis lupus*

A single animal presumed to be this species was seen on the Little Pamir east of Chakmactin Lake at dusk on the 12 June. Two animals were disturbed from an extensive area of boulder scree on the 19 June in the Tearginrhum Valley. NM observed two animals nearby in the Irgrhail Valley on the 20 June.

Red Fox *Vulpes vulpes*

This species was seen on most days in the Northern and Southern Mountains and occasionally on the bottom lands of the Little Pamir, but was not encountered in other surveyed regions.

Brown Bear *Ursus arctos*

Faeces believed to be from a bear, and probably 12-48 hours old, were found on the 22 June at ca. 4600 m on the slopes of Karachuqre Mountain in the Northern Mountains.

Stoat *Mustela erminea*

A single animal was seen in scree and sparse riparian vegetation, at ca. 3700 m along the Utchorromgash River on the 25 June.

'Marco Polo' Argali *Ovis ammon polii*

The species was only seen in the Northern Mountains of the Little Pamir (Table 2), where the remains of males were also commonly found. However, a few remains were also found in the Southern Mountains.

Table 2. Observations of 'Marco Polo' Argali

Date	Location	Number and sex of animals
14 June	Iraile Mountain (Northern Mountains)	Single female or young male
14 June	Iraile Mountain	7; including 3 adult females, 2 old lambs, and 2 juveniles/sub-adults
17 June	Endemin Valley (Northern Mountains)	5 females; 2 of them probably subadults.
17 June	Endemin Valley	3 mature males
17 June	Endemin Valley	3+ females with presumably same 3 males as previous
17 June	Endemin Valley	2 mature males
17 June	Endemin Valley	3 mature males
17 June	Endemin Valley	7 males of various ages
22 June	Karachuqre Mountain (Northern Mountains)	2 young adult males

Asian Ibex *Capra sibirica*

The Asian Ibex (inappropriately also called Siberian Ibex) was observed in all three survey regions (Table 3). Although the species was not observed in the Northern Mountains, remains of the species were found in this area.

Table 3. Observations of Asian Ibex

Date	Location	Number and sex of animals
31 May	West of Qala-i-Panj	Mixed group of ca. 19-20
6 June	East of Sarhad	Mixed group of 24+, including at least five kids
7 June	Between Dalys Pass and Shauwer Valley	3 young males or females*
8 June	Opposite Baharak	[10+ including young]
8 June	West of Xancook Valley	[30+]
20 June	Irrghail Valley (Southern Mountains)	8; including 3 kids and one juvenile
25 June	Utchorromgash Valley	5 males
25 June	Utchorromgash Valley	18-22+; including 7-10 kids, 6-7 adult females, 4 young adult/subadult males and one juvenile.
27 June	Between Xancook Valley and Shauwer Valley	11+; females? and 3 kids
27 June	Between Xancook Valley and Shauwer Valley	13 males of various ages

* also seen by the mammal team

3.4. Threats to wildlife

There are relatively few threats to wildlife, including birds within the area, especially as the remoteness of the site, its high altitude and arid climate significantly restricts the types and extent of human usage. Primary threats come from the following human activities: hunting (and other forms of direct persecution), timber and firewood collection, livestock grazing and economic, social and cultural changes within the area.

Hunting and other forms of direct persecution

Although there was little evidence of hunting found during the survey, undoubtedly some takes place, primarily of typical quarry species; wildfowl (ducks and geese) and galiforms (snowcocks and quails). UNEP & FAO (2003; pp. 48 & 88) noted the use of small firearms in the Wakhan used for hunting small quarry and Ostrowski (2007) reported that Chukar was "Actively hunted by inhabitants throughout winter in lower and upper Wakhan", while Ayé (2007) recounts observations of a 'trader' successfully hunting Oriental Turtle Doves. Concerns for the status of various quarry species in Afghanistan have been raised in the past (e.g. Paludan (1959) and Sayer and van der Zon (1981) both raised concerns for the Common Pheasant *Phasianus colchicus*), but it is likely that Chukar Partridge and snowcocks are not immediately threatened by such hunting (the status of Common Quail could not be established during the survey). All waterfowl however were very wary of human approach. 'Hunting' likely includes collection of eggs, as was reported by Petocz (1978a: p. 17), and on one island the remains of unhatched eggs, thought to be either shelduck or goose, were found along with human footprints. For breeding wildfowl hunting is likely to be a serious threat, and may be at least partly the cause of the low numbers of breeding birds (the small number of islands and the shallowness of the lakes early in the breeding season may also contribute, as natural predators may also take a significant toll).

Ostrowski (2006b) reported an instance of a Golden Eagle hunted and used for medicinal and traditional belief purposes. No such hunting was observed during the survey, and given the numbers of Golden Eagles seen (the commonest raptor by far), any hunting must be occurring at

relatively low levels. Hunting and other forms of direct persecution may affect other species, for instance a vulture carcass found during the survey had both wings suspiciously snapped off, but showed no other signs of injury.

Hunting of the larger mammals is presumably both more common and widespread, but again there was no direct evidence of such hunting seen during the survey, although clearly ungulate populations in particular are depleted, presumably mainly due to unsustainable hunting pressure. Although grazing competition with, and disease from, domestic livestock has also been blamed for in particular the demise of Argali (Petocz 1978a,b, UNEP & FAO 2003), the very low numbers, wariness and current distribution of animals is much more suggestive of hunting being the primary factor behind their current status. UNEP & FAO (2003) gave suggestions of the Wakhan being a source for the lucrative trade in mammal skins; no evidence was found for such during the survey, but neither was it expected to be found.

Timber and firewood use

Timber and firewood collection is only likely to be a threat in the small higher altitude valleys away from areas of cultivation. It is likely to be most acute in those valleys that lie along major routes such as the Sarhad to Bozai Gumbaz trail, and especially those valleys that are customarily used as camping areas. Limited observations suggest that there is probably a status quo, but given the small amounts of timber in each area, changes and loss of tree cover could occur rapidly. This would be of most significance, especially at the local scale, to breeding leaf-warblers, yet even within Afghanistan Wakhan populations of these species are unlikely to be very significant. Abandonment of use of remote valleys for livestock grazing may in future result in increases in woody cover, conversely increased use is more likely to result in loss or deterioration of cover.

In the cultivated lower main valleys the dynamics of woody vegetation cover are likely to be complex, most woody growth appears to be at least nominally under some form of human management and thus future cover will largely be dependent on economic, social and cultural trends, and could result in greater woody cover just as much as a decline in woody cover. There are clearly at present ongoing, externally orchestrated, schemes to increase woody cover, seemingly in the most part to create plantations for construction timbers. This at least in the short to mid-term is likely to increase habitat for some species, none of which however are particularly significant from a conservation perspective.

The riparian thickets of primarily willow and sea-buckthorn, although also clearly often 'managed', may fare differently from the plantations of willow and poplar (planted primarily for purposes of timber). The use of such thickets was not entirely clear during the surveys, some patches were very clearly irrigated, and may be used for fodder, firewood, timber and field fencing purposes, while other areas may be more natural in origin, but used in a similar manner. Their fate may be, at least partially, dependent on livestock grazing and agricultural trends, increases in both theoretically might lead to a decline in riparian thicket cover. But, as 'modern' economics overtakes the traditional economics of agriculture and livestock within the area, perhaps either an increase or loss of riparian thicket area are equally likely.

Livestock grazing

Livestock grazing is likely having some effect on bird communities of the Wakhan, although at present it is hard to determine precisely what those effects might be. One might speculate that the heavy spring and winter grazing of the northern mountains bordering the Little Pamir might in part be the reason for the differences in status of several species between the Southern and Northern Mountains. Alpine heath and meadow vegetation appeared richer in herbs in the Southern Mountains than in the Northern; but perhaps if indeed a real difference, it may be a consequence of climate, topography and geology. Heavy grazing of the Pamir itself may be partially limiting the diversity of birds present, and a factor behind the rather depauperate breeding bird community consisting of little more than Horned Lark, Citrine Wagtail, Lesser Sand Plover, Isabelline Wheatear and Redshanks. Effects of grazing are likely to be complex dependent on many factors other than numbers of livestock and affecting different bird species in different ways (see e.g. Loe *et al.* 2007).

Economic, social and cultural changes within the Wakhan area

Although it is not clear what the effects of economic, social and cultural changes within the area might be on wildlife, it is clearly inevitable that such changes will take place and are already taking place. As with the world over 'modern living' increases the sense of remoteness, and communities in remote places generally seek connection, either by creating connections in the form of transport infrastructure or by moving to areas with better connections. Both scenarios are apparently at play in the Wakhan, as logistical routes are being upgraded in the main valleys, and some remote settlements appear to have been abandoned. This in turn is likely increasing pressure on some areas, but perhaps alleviating pressure on wildlife in other areas. In particular the mountains south of the central stretch of the Wakhan River, and in general along the central Wakhan valley, may now be being utilised less than in previous decades by livestock herders. This appears to be notably so for the area south of the river from approximately the Shauwer valley to the Langar area, where old dwellings are visible, but local people questioned during the survey reported that these dwellings are no longer used and the mountains no longer grazed by livestock herds. However, modern economics may in other areas, for example the Little Pamir, be favouring larger herd sizes and forcing more intensive use of some mountain areas.

Livestock husbandry will inevitably change, it may result in increased herd sizes and more intensive grazing, it may perhaps also (after an increase?) decline. Change however is likely to be complex, and expressed not only in numbers of animals, but also in their spatial and temporal distribution. This will certainly affect a suite of bird species, although, it may be only a small number, of which the vultures are perhaps the most likely to be significantly affected by any major changes.

Agricultural practices will also inevitably change, and at this stage it is likely difficult to surmise what changes will occur, in what sequence. There is likely to be intensification (and consequent habitat changes, such as removal of marginal scrub, reduction in insect biomass), but perhaps also abandonment of marginal lands. Irrigation is likely to change in both nature (e.g. concrete culverts replacing earthen bunds) and extent. Again birds will be affected, but which and how is next to impossible to predict.

4.0. DISCUSSION

A translation of Marco Polo's epic travel account reads "Here, between two ranges, you perceive a large lake... [with] an extensive plain, covered with the richest verdure... In this plain there are wild animals in great numbers, particularly sheep of a large size" It is clear from other parts of the text that Marco Polo was referring to the Pamirs, and quite probably the Little Pamir (Marsden 1948; p 60-61). Of what is apparently now the province of Badakhshan Marco Polo writes "The mountains afford pasture for an innumerable quantity of sheep, which ramble about in flocks of four, five and six hundred, all wild; and although many are taken and killed, there does not appear to be any diminution." (Marsden 1948; p 56).

Unfortunately this is far from the case today. In the Little Pamir today one is lucky to see wild 'animals' other than marmots, while 'great numbers' of domestic sheep, goats and yak are common place, and the same is true also of the Big Pamir (Ayé 2007, Habib 2006, Naqeebullah Mostafawi and S. Ostrowski pers. comm. 2008). The probability of seeing wild large mammals in the lower main valleys is even lower. It is not clear if there are historical accounts of the bird fauna, and perhaps things are less changed than for the large mammals, but one cannot help thinking that probably the lakes of the Pamirs once held larger wildfowl breeding populations and that raptors and in particular vultures were probably once a much more frequent sight.

4.1. Conservation significance of the Wakhan

The significance of the Wakhan areas bird communities measured as a contribution to global biodiversity conservation (both needs and goals) is low. This is due to several factors, but primarily because the majority of species and habitats are largely under a low level of threat, and the majority of species do not occur in significant populations. Notably there are no species present that are both highly threatened and occur in significant populations; species which (arguably) would give the area high priority for allocation of global biodiversity conservation resources. However, the area should not necessarily be thought of as redundant or useless for bird conservation, it would be better to view the area as potential conservation area/land requiring minimal resource input to secure long-term representative bird communities, especially as the area seems likely to be the focus of other wildlife conservation activities (e.g. for large mammals) and other activities (ecotourism) that would maintain landscape characteristics suitable for general bird communities in the long-term. However, at present use of international biodiversity conservation resources in the Wakhan to support bird conservation are not warranted, given the plethora of much higher conservation needs elsewhere globally (e.g. BirdLife International 2003a).

The paucity of significant bird populations is due to a number of factors (see Section 3.1.). In a number of cases species with relatively small global ranges, are in the Wakhan at the edges of their range both geographically and or altitudinally, and naturally localised. This is the case for species such as Mountain Chiffchaff and Yellow-breasted Tit, and as such their populations in the Wakhan are likely to be marginal, because the area is unlikely to be ecologically optimal. There are almost certainly much more significant populations, in other parts of these species ranges where habitat conditions are more favourable, and even within Afghanistan populations are likely more significant elsewhere. In fact within Afghanistan the bird species with the smallest global breeding ranges are likely to be a suite of species with global distributions centred on the western Himalayas, only one of these species, Himalayan Pied Woodpecker reaches the Wakhan (others might be present, but they are certainly scarce and or localised),

while many if not all are present in forested areas on the eastern slopes of the Hindu Kush, especially in Kunar, Nuristan, Laghman and Nangarhar provinces.

Another primary factor in the lack of significant bird populations in the Wakhan is that species recorded from the Wakhan that are known to be in decline globally or regionally (e.g. Egyptian Vulture) are represented elsewhere by much more significant populations. This is either because the Wakhan naturally does not support high numbers of such species (a consequence of high altitude in many cases), or because species have declined in the Wakhan area in a similar manner to the declines that have occurred throughout such species ranges.

A number of birds are threatened or potentially threatened in the Wakhan area, and some have potential conservation significance. The birds likely to be at most risk in the area are:

Vultures, especially if there is a decline in livestock numbers or changes in husbandry which result in fewer livestock deaths and or availability of carcasses. Vultures are also likely to occasionally be persecuted and due to their natural low density, even low levels of persecution could potentially drive serious declines (RJT pers. obs. based on Southeast Asian vulture populations). Populations of Himalayan Vulture in particular may be nationally significant, and perhaps also of minor global significance. Badakshan may be nationally significant for Egyptian Vultures, but the Wakhan seems not to be.

Waterfowl are at risk from a combination of hunting and probably nest robbery. The relatively low numbers of breeding birds, may be a consequence of years of persecution, but certainly leaves them vulnerable today even from low levels of persecution. Breeding populations, especially of Bar-headed Geese have national significance.

Mountain Chiffchaff, leaf-warbler spp. and Blyth's Reed-Warbler are potentially at risk from loss of riparian habitats, most likely due to economic and population growth factors. However none of these species are likely to have even nationally significant populations in the Wakhan.

In a national context the area likely has significance for a few high altitude species probably at the edges of their global ranges (e.g. Tibetan Snowcock, Tibetan Sandgrouse and Red-fronted Rosefinch). At present it is unlikely that any of these species are seriously threatened within the Wakhan area. Similarly, Redshank may be on the southern margin of its breeding range in the Pamirs, but due to its huge global range the Wakhan population is of nothing more than national significance, and the species appears to be relatively secure.

The Wakhan area is likely to harbour many 'Biome-restricted Species', especially of the 'Eurasian High Montane Biome' and 'Irano-Turanian Mountains Biome' (see Evans 1994), (e.g. Lesser Sand Plover, Hume's Short-toed Lark, Brown Accentor, Red-tailed Wheatear, Hume's Whitethroat, Sulphur-bellied Warbler, Fire-fronted Serin and Crimson-winged Finch) many of them in high numbers, however in most cases their wide global distribution, and relative commonness in many areas, makes such species of little value in conservation prioritisation or management.

Even in terms of mammals the Wakhan areas conservation significance in a global context is only moderate (see for example maps of threatened mammal species in Schipper *et al.* in press).

The Wakhan population of Argali (as a species) is not exceptional, while the significance of the Wakhan to Snow Leopards is likely to be roughly equivalent to the ratio of the species's Wakhan range to its global range. Significance of Grey Wolf and Brown Bear populations is even lower, given their huge global ranges and relatively secure populations in some areas. Again Afghanistan's most significant mammal species and populations are quite probably those with a western Himalayan forest affinity, especially species such as the musk deer *Moschus cupreus* (see for example Schipper *et al.* in press, IUCN 2008 in press). For other organisms there are insufficient data to make a sensible judgement of likely significance of the Wakhan to global biodiversity conservation, but the bird and large mammal faunal patterns certainly give no support for potential significant occurrence of restricted range taxa in other groups.

4.2. An evaluation of the Important Bird Area status of the Wakhan

Two parts of the Wakhan area have been formally designated as Important Bird Areas, a designation bestowed by BirdLife International as part of a long-term project to identify a system of areas globally (global network) that would suffice to conserve the known global bird diversity in the long-term. The two areas selected, termed 'Big Pamir' and 'Little Pamir' in the IBA directory (Evans 1994, BirdLife International 2008a), seemingly correspond with the currently proposed Pamir-I-Buzurg protected area (formerly the Big Pamir Wildlife Reserve) and the currently proposed Little Pamir protected area.

Although, in theory BirdLife's IBA project is excellent, in practice there are flaws. It is certainly debatable whether any areas of the Wakhan really qualify as Important Bird Areas. One of the more significant issues with the IBA project in practice is the country centric approach that is generally used, i.e. breaking up bird habitat and bird faunas on the basis of geopolitical boundaries. In the case of Afghanistan this has two major consequences, firstly national conservation priorities or significant species nationally are not necessarily likely to be global significant or priorities. The Wakhan may prove to be a very significant part of the Afghan range of Red-fronted Rosefinch, Tibetan Sandgrouse and Tibetan Snowcock, but globally the Wakhan is likely an insignificant part of the range of these species. However, national significance and priority often appears to influence selection of IBAs, not only in Afghanistan, but elsewhere as for example in Vietnam (RJT pers. obs.). The second and more significant influence is that IBAs in Afghanistan were originally selected in conjunction with those of other Middle Eastern countries (Evans 1994). This amalgam of countries corresponds in the most part with a reasonably discrete biological region, characterised by arid low to mid elevation habitats, allowing sensible comparison of sites between countries. However the Wakhan, both physically and in terms of its bird community is clearly part of the greater Himalayan region, with additionally much in common also with Central Asia, but has relatively little in common (bar-widespread species) with the Middle Eastern biological region. Thus in evaluating the Wakhan's IBA status, comparison and evaluation needs to be made in the context of other greater Himalayan sites (e.g. especially sites in Pakistan, India and China), as well as Central Asian sites.

The IBA selection process demands, "An IBA must be amenable to conservation action and management" (BirdLife International 2008a). This is of course a very useful criterion in ensuring that the global network does not fail through inclusion of sites which cannot in reality be 'saved' from destructive factors. But, often in practice, it leads to 'blinkered' selection of predefined protected areas, even when the opportunity to use a 'blank slate' exists. In some cases the consequence is certainly that sub-optimal and mediocre sites (designated in some way

as protected areas) are selected as IBAs, while outstanding sites of irreplaceable conservation priority are left out for want of prior (informal or formal) recognition.

Afghanistan is currently a potential blank slate, and a reevaluation of areas of significance in the country is certainly warranted. Lack of field data, although obviously a limitation to effective selection of areas, should not constrain selection processes only to areas for which some data exists. This again in practice appears to be a common flaw of the IBA system (and in fact many gap analyses), as for example in Cambodia (RJT pers. obs.). Confidence in the power of field data is often seriously overestimated; single opportunistic records of species are, statistically speaking, hardly any different than 'no records at all' from an unsurveyed site. For sites with only an incomplete list of opportunistic bird records, site by site comparison is better conducted on the basis of surrogate factors, rather than on the basis of meaningless esoteric opportunistic records of birds. However, the IBA system of Afghanistan appears to have largely been based around those sites with data, albeit mostly anecdotal and outdated, and to have largely ignored the potential importance of currently unsurveyed sites.

This is blatantly obvious in the two Wakhan IBAs, apparently largely selected on the basis of 'Biome-restricted Species'. Not only, as already mentioned, are these largely Himalayan Biome-restricted Species rather irrelevant in comparison with 'Middle Eastern' areas, but the bird 'lists' as they stand either indicates severe under-recording and few data or very depauperate bird communities. If the later scenario were believed then the sites should not have been selected as IBAs, since an IBA should represent an outstanding example of a regional biome (and ought to support the majority of regional Biome-restricted Species). If the former interpretation is to be believed (as appears to have been the case), then clearly a depauperate site 'on paper' was selected on the basis of presumed significance (presumably taking into account other surrogate criteria), while equally good sites lacking data were obviously ignored. Thus, the 'presence of data' (but not the significance of the data) was seemingly the primary selection criteria used in designation.

The dangers of using data of poor quality, instead of potentially more informative surrogates, are exemplified in the selection criteria of the Big Pamir IBA, by the inclusion of Water Pipit (a Biome-restricted Species) as one of the species qualifying the area for IBA status. Surveys to date however, have failed to document the species as anything other than a scarce to occasional breeding bird, and thus hardly qualifying the area as significant for the species.

A cursory inspection of available data would suggest that IBAs covering montane species, could be situated in many areas of the Hindu Kush range through the northern and central regions of Afghanistan. At present the montane IBAs appear to be located at historically significant sites, not sites where landscape conservation factors have necessarily been taken into account. Thus the Salang Kotal IBA appears to have been selected simply because it has some 'incomplete' data in a data poor region. A major economic corridor, as the Salang Pass is, when viewed on the conservation planning table is unlikely to make an attractive conservation area. Why not instead select areas of the high Hindu Kush plateau, to the northeast or southwest, which although they may lack data on birds, clearly have the necessary (surrogate) characteristics (e.g. altitude range, topography, geology, remotely discernable vegetation structure and evidence of human use) to give them similar if not higher probability than the Salang Pass of having significant bird communities at least in a national context.

But, there are certainly more important montane areas for bird conservation in Afghanistan. For one, parts of the high Hindu Kush plateau of central Afghanistan, that supports Afghanistan's only endemic bird, the Afghan Snowfinch, are certainly of higher IBA value than the Wakhan. But, even these areas are not the most significant regions of the country for montane bird conservation. The western Himalayas have a rather distinct bird fauna that is apparently tied to the distinctive vegetation formations, especially of oak and pine, in this region (see Sections 3.1. & 4.1.; BirdLife International 2008b, Stattersfield *et al.* 1989, Rasmussen and Anderton 2005). Even on recent remote imagery it is clear that forested montane areas are still extensive, especially in Afghan's Kunar Province (also adjacent areas of Nuristan and Laghman Provinces), also clear from investigative work that these forests are threatened (WCS Afghanistan Program unpublished), and equally clear that these forest support (based on historical surveys e.g. Paludan 1959, Sayer and van der Zon 1981) or almost certainly support (based on range in adjacent Pakistan; see e.g. Rasmussen and Anderton 2005) most if not all the characteristic western Himalayan birds species. Although many of these species are yet to be considered globally threatened, the Afghan populations of them are almost certainly large enough to be considered globally significant. IBAs in this area, would thus not only cover the majority of Wakhan species (there would be some absences e.g. those with a Central Asian and Tibetan affinity; see above), but also make a significant Global contribution to the conservation of western Himalayan species. One IBA, the Pech and Waygal valleys IBA, currently covers some of this region, but inexplicably excludes the highest altitudes (Evans 1994, BirdLife International 2008a), which would undoubtedly capture the majority of species present within the higher areas of the Wakhan.

Afghanistan, as already mentioned, is to some degree a blank slate for wildlife conservation, albeit, one in unpredictable flux. A modern day approach to conservation management and planning is clearly warranted, especially one which can break away from the limitations of historical ornithological data and conservation planning of the 1960s and 70s.

4.3. Tourism and nature conservation in the Wakhan

There is certainly value in the scenic splendour of the area, and the historical legacy of the area from 'silk road' times and the account of the area in Marco Polo's travel narrative, through the imperial era of the nineteenth century to the Russian occupation of recent times. However, the nature tourism potential of the area is currently rather low, and there is little to entice the discerning 'nature' tourist. There are only few localised or 'hard to get' species in the Wakhan, and those that there are, are largely easier to see elsewhere (e.g. 'Marco Polo' Argali). Furthermore, there are also no particular wildlife spectacles to entice the more discerning nature tourists.

The later however need not be the case, as 'easy to see' populations of large mammals, are generally a tourist draw the world over. At present it is difficult to see large mammals, other than marmots. Ibex and Argali are not easily approachable and not necessarily guaranteed in a week or two's field time, unless remote locations are visited. The larger carnivores are very much more difficult to see, while waterfowl at least in the summer are scarce and very wary. With appropriate management and time however, wildlife spectacles could be developed. Argali could once again graze the easily accessible Pamir slopes in large and approachable herds,

wolves and bears could become more frequent sightings, and large numbers of breeding waterfowl could theoretically populate the lakes.

5.0. RECOMMENDATIONS FOR WILDLIFE CONSERVATION IN THE WAKHAN

5.1. Prioritisation and use of biodiversity conservation resources

Given the areas relatively low global priority for allocation of wildlife conservation resources, wildlife conservation activities and the resources for carrying out such activities are best framed within the context of social and economic development needs of the Wakhan. Such an approach should be particularly aimed at international donors with ongoing and planned social and economic development activities in the area. An obvious example would be consideration of whether ongoing wood plantation schemes (are or) can be optimised for wildlife conservation purposes. Another would be to ensure that environmental education forms a significant part of the curriculum of local schools, which are currently being supported by external aid.

5.2. Potential goals and overarching actions

Restore parts of the Wakhan, especially the Pamirs, to a state that would approximate its wildness and wild animal populations of Marco Polo's time. – This is achievable and would certainly give the area great tourism potential, but will take many years to achieve. This would entail an enlightened cultural, social and economic development vision for the Wakhan based around tourism, nature conservation and conscientious land stewardship. Currently there seems to be a sense that wildlife conservation, especially large mammal conservation, requires annexation to remote uninhabited regions, regions which in general are probably suboptimal wildlife habitat. Although, the spatial separation of wildlife conservation activities and centres of human activity is in general a sensible measure, ensuring greater probability of successful wildlife conservation, in the case of the Pamirs there is optimism for a more integrated approach. Core areas for wildlife can be formed around remote regions, not used extensively for livestock grazing (e.g. Section 3.4.), but other area of the Wakhan, especially the Pamirs might also be compatible with restoration of wildlife populations, especially in a phased approach initially undertaken alongside the current pastoral use of the area.

Such optimism exists, because it is hard to see how land development and use in the Pamirs could become highly lucrative. The short growing season and harsh climate would seem to preclude agricultural development, and (as yet) the area appears to have no natural resource value in the form of mineral deposits. Livestock which are currently the areas primary economic source presumably could be developed further, but remoteness and suboptimal (arid high altitude) habitats, presumably limit the economic growth potential of livestock revenues. As long as the areas isolation and remoteness persist, the harshness of human existence in the Pamirs, and high cost of living in a modern world, would seem to preclude it becoming a population centre with self sustained economic growth. On such a stage the economic potential of tourism and wildlife utilisation might favourably match, and be a viable alternative to that of livestock rearing. However, despite the theoretical favourability of economics based on tourism and wildlife, the challenges of changing traditional and cultural views of wildlife and acceptable livelihoods should not be underestimated. The necessity of such change is likely to be the biggest challenge to wildlife conservation activities in the Wakhan.

Achieving such a vision for the Wakhan requires long-term commitment. Donors and projects hoping for, and expecting overnight success are unrealistic and unhelpful. External support for conservation activities (especially a management framework) in the Wakhan must have a suitably realistic outlook and time frame; at least a twenty year expectation of the need for external support (especially expertise, but also funding) is reasonable.

To achieve such changes, initially, little action beyond protection of wildlife and basic outreach to local communities needs to be undertaken. Large mammal populations in particular are likely to rebound significantly once hunting is controlled.

Commercial wildlife utilisation, in the form of trophy hunting or perhaps game farming, although a clearly beneficial wildlife conservation tool in some countries of the globe, clearly also requires an advanced and highly functional wildlife management organisation. As such potential wildlife utilisation in the Wakhan is a long-term consideration, no more of a 'quick fix' than tourism supported wildlife conservation. In the short- and mid-term wildlife conservation activities can only hope to be supported by external, international donor aid.

One of the most important factors in any successful wildlife conservation activities in the Wakhan is monitoring and understanding of social, cultural and economic changes within the area, and a conservation approach that is ready to evolve with such changes as required.

5.3. Specific conservation actions to benefit tourism potential and wildlife

Increase the tourism potential of the area by creating wildlife spectacles. This could include:

Wildfowl protection schemes, including local nest protection (based on a WCS Cambodian program model) and perhaps creation of artificial islands, to increase the breeding populations of waterfowl especially Bar-headed Geese.

Supplemental vulture feeding (vulture restaurants) to both safeguard and monitor vulture populations, but also to provide an easy means for tourists to witness the splendour of the resident vultures.

Monitor and protect wooded valleys above Sarhad and Gaz Khan, as well as any woodland formations that occur in side valleys of the main Wakhan and Panj rivers below Sarhad and Gaz Khan. Alternative wood sources may need to be developed dependent on the claims and needs of local communities, especially those that live in the higher reaches of the Wakhan. Wherever possible these should be developed as plantations in the main Wakhan and Panj valleys, as already appears to be the case. Increased tourism may impact wooded valleys negatively (especially in their use as overnight camping spots), which itself would negatively impact tourism (already some camping areas show aesthetically displeasing signs of tree and shrub damage). With the inevitable development of tourism, measures for environmental mitigation should be an integral component of all tourism development activities in the area. Guidelines should be drawn up amongst other things on; appropriate locations for camping sites, use of bottled fuel for cooking etc. and removal of woody vegetation.

5.4. Assessment of species trends within the Wakhan

It was not possible within the time constraints of producing this report to fully synthesise past literature relating to the Wakhan or adjacent regions in order to determine more precisely which if any species have undergone detectable declines, and which would therefore likely to be

at risk and potentially in need of conservation measures. The following sources could usefully be pursued to achieve the above end:

The German accounts of Nogge (1973) and Niethammer (1973).

Russian literature pertaining to the Wakhan and Pamirs, and any Russian or historical literature relating to the former 'Russian' Pamir Mountains of Tajikistan (e.g. Severtzow (1883)).

The original diaries and notes of Colonel Biddulph and Dr. Stoliczka used by Sharpe (1891) and which may now be in the Natural History Museum, London.

Additionally it would be useful to attempt to contact Roger Petocz, to determine if additional field-notes of the surveys in the 1970s exist.

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Annex 1. Bird species recorded during the survey

Abundance categories were assessed for each bird species encountered during the survey, in relation to its relative abundance as determined during the course of the survey. Abundance was assessed on a five-point scale based on the encounter frequency, taking into account the appropriateness of methods to detect a species, and other factors (including ecology) that affect

the observability of a species (see Timmins & Ou 2001). For many species, abundance could not be assessed. These abundance categories are:

Abundant – equivalent to groups being recorded an average of 15 times daily (or for flocking species flocks being recorded several times daily);

Common – equivalent to being recorded daily;

Frequent – equivalent to being recorded on over half of days;

Occasional – equivalent to being recorded on fewer than half of days;

Present – abundance not assessed.

The list should not be considered exhaustive and should only be used as an indication of the bird community present. For several habitats survey effort was low (see Table 1, Section 2.1.), and thus the few records presented should not be considered a good representation of these communities.

Table 4. Bird species recorded during the survey

Species	Geographic region	Lower main valleys		Central Wakhan Valley		Little Pamir		Ishkashim to Fayzabad
		Status	Habitat	Status	Habitat	Status	Habitat	
<i>Podiceps cristatus</i>	Great Crested Grebe					LC	W	
<i>Phalacrocorax carbo</i>	Great Cormorant					O	W	
<i>Ardea cinerea</i>	Grey Heron	O	WI			LC	WI	
<i>Ixobrychus minutus</i>	Little Bittern	O	(M)					
<i>Ciconia nigra</i>	Black Stork					O	WI	
<i>Anser indicus</i>	Bar-headed Goose					LC	W	
<i>Tadorna ferruginea</i>	Ruddy Shelduck					C	WIM(HS)	
<i>Anas strepera</i>	Gadwall					F	W	
<i>Anas penelope</i>	Eurasian Wigeon					O	W	
<i>Anas platyrhynchos</i>	Mallard					F/C	W	
<i>Anas strepera / Anas platyrhynchos</i>	Gadwall / Mallard	P	WI					
<i>Anas clypeata</i>	Northern Shoveler					LC	W	
<i>Anas acuta</i>	Northern Pintail					LC	W	
<i>Anas querquedula</i>	Garganey					LC	W	
<i>Anas crecca</i>	Common Teal	LC?	WI			LC	WI	
<i>Aythya ferina</i>	Common Pochard					O	W	
[<i>Aythya nyroca</i>	Ferruginous Duck]					[O]	W	
<i>Aythya fuligula</i>	Tufted Duck					O	W	
<i>Mergus merganser</i>	Common Merganser (Goosander)	LP	I	P	I	C	IW	
<i>Haliaeetus leucoryphus</i>	Pallas's Fish-eagle					O	IW	
<i>Gypaetus barbatus</i>	Bearded Vulture (Lammergeier)	O	A	O	A	LC	AX	P
<i>Neophron percnopterus</i>	Egyptian Vulture	O	A					P
<i>Gyps himalyensis</i>	Himalayan (Griffon) Vulture					LF/C	AX	
<i>Aquila chrysaetos</i>	Golden Eagle			F/C	A	LC	AX	
<i>Falco tinnunculus</i>	Common Kestrel	O	D	[O]	(B)			[P]
[<i>Falco cherrug</i>	Saker Falcon]	[O]	A			[O]	A	
<i>Falco peregrinus</i>	Peregrine Falcon	O	A(F)					
<i>Falco</i>	falcon sp(p).					O	A	

<i>Tetraogallus himalayensis</i>	Himalayan Snowcock			LC	C	[O?]	?	
<i>Tetraogallus tibetanus</i>	Tibetan Snowcock					P	CH	
<i>Alectoris chukar</i>	Chukar	P	R	LC	F?			
<i>Fulica atra</i>	Eurasian Coot	F/LC	W			LC/A	W	
<i>[Pluvialis squatarola</i>	Grey Plover]					(1)		
<i>Charadrius mongolus</i>	Lesser Sand Plover	O	M	LC	MH	LC/A	MHW	
<i>Charadrius dubius</i>	Little Ringed Plover	C/F	I					
<i>Gallinago</i>	snipe sp.	P	R					
<i>Tringa totanus</i>	Common Redshank	O	M			LA	MWI	
<i>Tringa ochropus / Tringa glareola</i>	Green / Wood Sandpiper	P	I					
<i>Calidris alpina</i>	Dunlin					O	WI	
<i>Himantopus himantopus</i>	Black-winged Stilt					O	WI	
<i>Phalaropus lobatus</i>	Red-necked Phalarope (2)					O	W	
<i>Larus ichthyaetus</i>	Great Black-headed Gull (Pallas's)					LC	W(I)	
<i>Larus brunnicephalus</i>	Brown-headed Gull					LC	W(I)	
<i>Larus ridibundus</i>	Common Black-headed Gull					F	W(I)	
<i>Larus</i>	gull sp.	O	W					
<i>Sterna nilotica</i>	Gull-billed Tern					O	W	
<i>Sterna hirundo</i>	Common Tern					LC	WI	
<i>Syrrhaptes tibetanus</i>	Tibetan Sandgrouse					O?	H?	
<i>Columba leuconota</i>	Snow Pigeon	LP	FC	C	MIC	LC?	MHI?	
<i>Columba livia</i>	Rock Pigeon (Dove)	A/C	F					P
<i>Columba rupestris</i>	Hill Pigeon	A/C	F	C	MIC	[O]	?	P
<i>Streptopelia turtur / Streptopelia orientalis</i>	turtle-dove sp(p).	F/C	FPR					
<i>Cuculus canorus</i>	Common Cuckoo			F?	B			
<i>Athene noctua</i>	Little Owl			P	(C)			
<i>Apus melba</i>	Alpine Swift							P
<i>Apus apus</i>	Common Swift	P	A	O	A			P
<i>Merops</i>	bee-eater spp.							P
<i>Coracias garrulus</i>	European Roller	O?	P					[P]
<i>Upupa epops</i>	Common Hoopoe	C/F	FPR	O/F	B			P
<i>Dendrocopus himalayensis</i>	Himalayan Pied Woodpecker	P	P					
<i>Dendrocopus leucopterus</i>	White-winged Pied Woodpecker	P	P					
<i>Calandrella acutirostris</i>	Hume's Short-toed Lark	[P]	(F)	LC	HM	LC	MH	
<i>[Calandrella rufescens</i>	Lesser Short-toed Lark]	[P]	(F)					
<i>Alauda arvensis / Alauda gulgula</i>	Eurasian / Oriental Skylark	C/A	F					
<i>Eremophila alpestris</i>	Horned Lark			LA/C	HM	A	SHM	
<i>Riparia (paludicola) chinensis</i>	Grey-throated Sand-Martin (Plain)			O	A			
<i>(Hirundo) Ptyonoprogne rupestris</i>	Eurasian Crag-Martin	LP	A	LP	A			
<i>Hirundo rustica</i>	Barn Swallow	O	A			P	A	P
<i>Hirundo daurica</i>	Red-rumped Swallow							P
<i>Delichon urbicum</i>	Northern House-Martin	LP	AC	LC	AC	L?P/O	A	
<i>Motacilla alba personata</i>	White Wagtail	C	WI					P
<i>Motacilla citreola calcarata</i>	Citrine Wagtail	C	WIM	LC/A	MI	A	M	
<i>Motacilla cinerea</i>	Grey Wagtail			LC	I			

<i>Anthus campestris / Anthus similis</i>	Tawny Pipit / Long-billed Pipit					L?O?	(HM)	
<i>Anthus roseatus</i>	Rosy Pipit			LC?	M			
<i>Anthus spinoletta</i>	Water Pipit					O	M?	
<i>Lanius schach</i>	Long-tailed Shrike (Rufous-backed)	P	FR			O	(M)	
<i>Cinclus cinclus</i>	White-throated Dipper	P	I	LC?	I	LC?	I	P
<i>Prunella himalayana</i>	Altai Accentor					C	CX	
<i>Prunella fulvescens</i>	Brown Accentor			C	C	C	C(H)	
<i>Turdus viscivorus</i>	Mistle Thrush			O?	B			
<i>Myophonus caeruleus</i>	Blue Whistling-thrush							P
<i>Monticola solitarius</i>	Blue Rock-thrush	P	E					P
<i>Monticola</i>	rock-thrush sp.			O?	F?			
<i>Phoenicurus ochruros</i>	Black Redstart	C	E	A	F	O/F	SH(with features)	
<i>Phoenicurus erythrogastrus</i>	White-winged Redstart (Guldenstadt's)			LC	FIC	C/A	CHX(with features)	
<i>Chaimarrornis leucocephalus</i>	White-capped River-chat			C?	I			
<i>Oenanthe oenanthe</i>	Northern Wheatear	F/C	E	F/C	FHM	LO	(HM)	
<i>Oenanthe picata</i>	Variable Wheatear							P
<i>Oenanthe pleschanka</i>	Pied Wheatear	O?	(F)					
<i>Oenanthe (xanthopyrma) chrysopygia</i>	Red-tailed Wheatear	O	D					P
<i>Oenanthe deserti</i>	Desert Wheatear			L?F/C?	F?	LF/C	HS(with features)	
<i>Oenanthe isabellina</i>	Isabelline Wheatear	O	MDE	LC/A	HM	LC/A	HMS	
<i>[Cettia cetti</i>	Cetti's Bush-Warbler]	[C?]	R					
<i>[Acrocephalus dumetorum</i>	Blyth's Reed-Warbler]	[A]	R					
<i>[Hippolais</i>	warbler sp.]					[O]	?	
<i>Phylloscopus sindianus</i>	Mountain Chiffchaff	A	R	C	B			
<i>Phylloscopus griseolus</i>	Sulphur-bellied Warbler			C?	J(B)			
<i>[Phylloscopus trochiloides</i>	Greenish Warbler]	[C?]	PR					
<i>[Phylloscopus magnirostris</i>	Large-billed Leaf-Warbler]							[P]
<i>Phylloscopus</i>	leaf-warbler sp. A			C/A	B			
<i>Phylloscopus</i>	leaf-warbler sp. B			C	B			
<i>Sylvia nisoria</i>	Barred Warbler			P	B			
<i>[Sylvia (curruca) althaea</i>	Hume's Whitethroat]	[A]	FR	[LP]	B			
<i>Parus flavipectus</i>	Yellow-breasted Tit	C	RP					
<i>Sitta tephronota</i>	Eastern Rock Nuthatch							P
<i>Tichodroma muraria</i>	Wallcreeper			LP	C			
<i>Emberiza cia</i>	Rock Bunting	P	(E)	C/A	F			
<i>Emberiza bruniceps</i>	Red-headed Bunting	LC	F					
<i>Serinus pusillus</i>	Fire-fronted Serin	C/A	RFP	C/A	B			
<i>Carduelis carduelis caniceps</i>	(Grey-crowned) Eurasian Goldfinch							P
<i>Carduelis flavirostris</i>	Twite	F/C	RF	C/F	IMBH			
<i>Leucosticte nemoricola</i>	Plain Mountain-Finch	LF	FR	A/C	all	LP/O	(HM)	
<i>Leucosticte brandti</i>	Brandt's Mountain-Finch			C	all	A/C	G	
<i>Rhodopechys sanguinea</i>	Crimson-winged Finch	F/C	FR					
<i>Bucanetes githagineus / Bucanetes mongolicus</i>	Trumpeter Finch / Mongolian Finch			O	(HM)			
<i>Carpodacus erythrinus</i>	Common Rosefinch	C	RP	C	B			
<i>[Carpodacus rubicilloides</i>	Streaked Great Rosefinch (Streaked Rosefinch)]			[P]	(H)			

<i>Carpodacus (rubicilla) severtzovi</i>	Spotted Great Rosefinch (Great Rosefinch)			C?	SHF?			
<i>(Carpodacus) Pyrrhospiza punicea (puniceus)</i>	Red-fronted Rosefinch					O	H?	
<i>Carpodacus / Pyrrhospiza</i>	large rosefinch spp.			C	SHF?	O	HC?	
<i>Montifringilla nivalis</i>	White-winged Snowfinch			LC	F	LP/O	HS(with features)	
<i>Passer domesticus</i>	House Sparrow	C	FPR	O	IM			P
<i>Passer montanus</i>	Eurasian Tree Sparrow	A	FPR					P
<i>Sturnus pagdarum</i>	Brahminy Starling			O	B			
<i>Sturnus vulgaris</i>	Common Starling	O/F	FP					
<i>Acridotheres tristis</i>	Common Myna							P
<i>Oriolus (oriolus) kundoo</i>	Indian Golden Oriole (European)	F/LC?	P	O	B			[P]
<i>Pica pica</i>	Eurasian Magpie	C/A	FPR	F/O	B			P
<i>Pyrrhonorax pyrrhonorax</i>	Red-billed Chough	LC/A	FMD	C	SHCIM	C/A	G	
<i>Pyrrhonorax graculus</i>	Alpine Chough	LP	FM	C?	SHCIM	P/F?	G?	
<i>Corvus monedula</i>	Eurasian Jackdaw	O	?					
<i>Corvus corone</i>	Carrion Crow	P	FPR					
<i>Corvus (macrorhynchus) japonensis</i>	Large-billed Crow	O	?					
<i>Corvus ruficollis</i>	Brown-necked Raven	P	FPR					
<i>Corvus corone / ruficollis</i>	Carrion Crow / Brown-necked Raven	C	FPRD					
<i>Corvus corax</i>	Common Raven (Northern)	P/F?	F?	P/O	G	C/F	G	

Key:

Status: A = abundant; C = common; F = frequent; L (prefix) = local; O = occasional; P = present, abundance unknown; [] = provisional or unconfirmed identification during the surveys.

Habitat: the predominant habitats in which the species were recorded are given, in some instances habitat association was not clear and this is indicated by either '?', or parentheses when the association with habitat is likely to be of minor significance. Codes are as follows:

A = aerial species and those which forage from the air

F = farmland

P = plantations

E = edge or mixed habitats (in the lower main valleys), generally with structure and in the vicinity of water

W = wetlands (lakes & pools; birds with a strong aquatic association))

I = rivers / streams (birds with a strong aquatic association)

M = pasture / meadow / bog

R = riparian scrub / woodland

B = birch-willow thicket

D = semi-desert (steppe; lower main valleys)

S = alpine steppe

H = alpine heath

J = areas with significant juniper / rose formations

C = scree / crags (/ cliffs)

F = locally in alpine steppe/alpine heath with features such as streams, riparian vegetation, juniper and rose and or screes and crags

X = high montane

G = wide-ranging opportunist species

Notes: 1 = remains found and provisionally identified as those of Grey Plover.

2 = identified as this species solely on the basis of range.

