

Rapid Assessment of Critical Habitat, Birds and Human Interaction  
in  
Kapilvastu and Dang Deukhuri Districts, Nepal

29 October - 14 November 2006 and 16 April - 4 May 2007

Summary Report

prepared for

WWF-Nepal Terai Arc Landscape Programme (TAL)  
Bird Conservation Nepal (BCN)

Jack H. Cox

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K. K. K. K.  
WWF work in all  
parts: rural & protected

Introduction.

A rapid assessment of birdlife and sites critical for biodiversity conservation was undertaken in Kapilvastu and Dang Deukhuri districts in winter 2006 and spring 2007. The main objectives were to 1) obtain baseline and seasonal comparison data, 2) determine basic socio-economic patterns and human interaction with habitat, and 3) highlight conservation needs. Included for some sites in Kapilvastu are comparative observations from visits made by the author 30 years ago.

The critical sites identified comprise a fragmented array of relict grasslands, seasonal and perennial marsh, riparian scrub forest, pond bank scrub and littoral, sisoo-acacia woodland, mango-sisoo groves and mixed deciduous-evergreen forest.

These sites lie within the area of WWF's Terai Arc Landscape (TAL) program, a recently operationalized long-term effort to protect, restore and link lowland ecosystems in northern India and the western and central *terai* of Nepal.

An account of birds recorded systematically during the assessment is in preparation. This will table data from individual areas, provide details of uncommon and rare bird records, particularly those species indicative of critical habitats, discuss relative abundance and distribution, and recommend specific conservation actions.

Follow-on fieldwork is urged with the aim of enabling local communities to play a leading role in the design and implementation of a community-based, mutually beneficial conservation and development initiative. Towards this aim, the author proposes conduct in 2008 of additional spring and winter surveys, and production of a comprehensive technical report to elaborate the results of the various assessments and better assist TAL-BCN activities.

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## Methods.

Sites of interest for reconnaissance were determined from results of previous visits to Kapilvastu (see Cox 2002, Cox 2005, Cox and Giri 2007) and further perusal of 1:25,000 topographic maps of Kapilvastu (JICA/HMG-Nepal 1993) and Dang Deukhuri (Finnaid/HMG-Nepal 1997).

Habitat transects emphasized cross-sections of representative diversity (Fig. 1), primarily during early mornings and late afternoons when birds were more active and light more amenable to photography. The route usually avoided main trails and tracks in order to adequately assess reduced degrees of human disturbance, and in 2007 entailed recording by GPS of important landmarks (e. g., sites of biodiversity interest, campsites, lunch stops, major changes in route, river crossings).



Fig. 1. Track west of Taulihawa, Kapilvastu.

Participatory Rural Appraisal (PRA) was used to collect information from local people on their environment and socio-economic condition. The main technique was informal interviews using open-ended questions to elicit local knowledge, prioritized needs, and ideas of local residents that can help conceptualize a feasible integrated conservation and development initiative.

Each bird known from a sighting or vocalization was recorded on microcassette tape with data on locality, elevation and habitat. Breeding activity and unusual or distinctive behavior were similarly noted.

## Results.

Habitat of many transect areas is inaccurately depicted on the 1:25,000 topographic maps. These errors, some of which are very substantial, evidently arise from incorrect interpretation of aerial photography and lack of ground verification, changes in vegetation/waterways, and expansion of villages and roads since the maps were published in 1993 and 1997.

Twelve conservation-critical sites were identified and assessed. The main characteristics of each are summarized as follows:

1. **Khadara Phantha.** A large patch (c. 2 km<sup>2</sup>) of relict grassland, old fields, dry scrub and riverine forest in the SE corner of Kapilvastu (Fig. 2). The site was identified in January 2002 as an exigency for bird diversity and habitat (Cox 2002). The grassland component is mostly intact but extensively cut in winter for thatch.

**Habitat.** Deep monsoonal inundation and lack of irrigation in winter and spring make the *phantha* unsuitable for rice production. However, a November 2005 visit concluded that Khadara was highly endangered due to partial conversion of the



Fig. 2. Northwestern Khadara Phantha, Kapilvastu, November 2005.

of the E and NE sections for winter crops of mustard and lentil, and plans by the landowners for expanded conversion (Cox 2006). The area cultivated in 2006 was estimated as 20-25% (Cox and Giri 2007), somewhat larger than in 2005 (pers. obs.) (Fig. 3). The landowning Muhammad Ali family has agreed to minimize additional conversion contingent upon financial considerations. The winter crops are mainly for family consumption, but in times of economic hardship increased production provides much needed income (Muhammad Arif, landowner family member, pers. comm.).



Fig. 3. Plowed NE section of Khadara Phantha, Nov. 2006.



Khadara Phantha is a mosaic of habitats where birds take cover (Fig. 4), feed and resident species presumably breed. Grassland area was estimated as 100 ha by WWF-Nepal from measurement of topographic map features assigned to scrub and open woodland. However, GPS waypoints of W Khadara taken in 2007 reveal other inaccuracies in depiction. Grassland extends farther west and relatively species-rich old fields and adjoining scrub are shown as

Fig. 4. Date palm tapped to make toddy. The dense crown is used by birds such as Grey Francolin for roosting and by others for nesting. NW edge of Khadara Phantha, April 2007.



scattered trees. By contrast, a c. 200 m band of scrub along the Nepal-India border is in fact fields and grazed grassland. Nonetheless, when the Kothi Khola riverine forest strip (Figs. 5, 6) is included, the Khadara association of habitats covers a considerably larger area, c. 150-200 ha.



Fig. 5. Mature *jamuwa* trees, N bank Kothi Khola, Khadara Phantha, April 2007.



Fig. 6. Kothi Khola, northern border of Khadara Phantha, April 2007.

Reconnaissance of Khadara in April 2007 showed that Kothi Khola vegetation in the N, NE and N-C borders of Khadara was in the process of being extensively cut (Fig. 7). This is done

routinely, every 4-7 year, and primarily affects *jamuwa* trees and shrubs; *neem* and *latura* are also cut but regenerate more slowly (M. Arif, pers. comm.). Limbs and stems are sold for fuelwood to local brick kilns but fetch only Rs. 2 per kg. Most of the Silk Cotton (*simal*) *Bombax ceiba* trees are protected, which now dominate the degraded riverine forest, and on recently cut banks, solely comprise the tree component. About half of the *phantha* had been cut the previous winter. Stacks of decaying grass were left in harvested sections as fewer local buyers were found in late 2006 or early 2007 (Fig. 8) (M. Arif, pers. comm.).



Fig. 7. Cutting of *jamuwa* trees, Kothi Khola, April 2007.

**Birds.** Counts of birds by the author and Dinesh Giri sampling Khadara's various habitats



Fig. 8. Grass stacks, Khadara Phantha, April 2007.

produced 82 species 29-31 October 2006. In a similar sampling 17-19 April 2007, but with c. 30% less search time, the author recorded 63 species.

Collation of all known bird records from the Khadara Phantha area yields 159 species (updated unpubl. data). Although the data have not yet been statistically analyzed, comparative counts among area habitat types indicate that grassland is relatively species poor. Old and planted fields, peripheral scrub and the ruins of a brick factory (Fig. 9) show greater diversity and abundance of birds. Kothi Khola vegetation, in particular tall dense fragments bordering E Khadara, remain barely inventoried.



Fig. 9. Brick factory ruins, Khadara Phantha, April 2007.

Prior to 2007 all records were from late autumn or winter. No assessment of habitat or birds has been undertaken in the monsoon. Surveys in that season are needed to understand the effects of flooding and importance of area habitats for breeding birds.

Various rare, uncommon and local birds have been recorded from the Khadara mosaic. Grassland-dependant or favoring species include Bristled Grassbird *Chaetornis striates*, Singing Bushlark *Mirafra cantillans*, Spotted Bush Warbler *Bradypterus thoracicus* and Common Quail *Coturnix coturnix*. Peripheral fields and scrub have produced Yellow-wattled Lapwing *Vanellus malabaricus*, Rustic Bunting *Emberiza rustica*, Indian Silverbill *Lonchura malabarica*, Clamorous Reed Warbler *Acrocephalus stentoreus*, Large Grey Babbler *Turdoides malcomi*, Sarus Crane *Grus antigone*, Tawny Pipit *Anthus campestris* and Tree Pipit *Anthus trivialis*. Orange-breasted Green Pigeon *Treron bicincta*, Little Cormorant *Phalacrocorax niger* and Brown Fish Owl *Ketupa zeylonensis* have been observed at the Khoti Khola.

The Khadara Phantha area is especially good for raptors. White-rumped, Cinereous and Red-headed Vulture (*Gyps bengalensis*, *Aegypius monachus* and *Sarcogyps calvus* respectively), Booted Eagle *Hieraaetus pennatus*, Red-necked Falcon *Falco tinnunculus*, Eurasian Eagle Owl *Bubo bubo*, Lesser Spotted Eagle *Aquila pomarina*, Greater Spotted Eagle *A. clanga* and Indian Spotted Eagle *A. hastata* have been recorded.

**2. Golaha-Marathi Khola wetlands.** An extensive complex (c. 2.5 km<sup>2</sup>) of swamp woodland, herbaceous mats and riparian scrub near the Nepal-India border W of Hatihawa, Kapilvastu District. The E periphery was surveyed in November 2006; the W periphery in November 2006 and April 2007.

**Habitat.** This perennial wetland was formed many years ago (50-100?) by damming of the Marathi Khola just S of the Nepal-India border. Assessment was hampered by inability to ford the Marathi in either autumn or late spring (water

depth >2m), necessitating a 3 km detour N to a rudimentary toll bridge at Belbhariyaghat. Extensive areas along the SW periphery E towards the Marthi, apparently denoted as marsh on the topographic sheet (no legend given), are dry and overgrazed by late spring. Fallow field and seasonal wetland plants are harvested for fuelwood (Fig. 10). Much of the permanent water is overgrown by aquatics, mainly water lilies and Water Hyacinth *Eicchornia crassipes*. Dense submergent vegetation was noted in shallow areas along the E periphery. Open water is used intensively to fish by set and cast nets. A local fisherman said catches were stable in recent years but included few large fish.



Fig. 10. Gulari women and *aksa dal*, west Golaha wetland, April 2007.

Good mixed woodland, dominated by *simal*, *jamuwa* and thorny shrubs, occurs along each side of the Marthi. Some patches include tall grassy ground cover and a dense littoral of herbaceous plants, broadleaf thickets and lianas, (Fig. 11), bordered extensively by rice, wheat and *dal* fields.

**Birds.** A relatively high diversity of birds was recorded on 21 April 2007. A morning search of W Golaha and the Marthi Khola produced 43 species, contributing most of the day's transect total of 65 species - highest of all daily totals in Kapilvastu or Dang, either in 2006 or 2007. Golaha was said to be good for duck hunting in the 1990s, with open water areas best accessed from India. (M. Arif, pers. comm.).



Fig. 11. Marthi Khola banks, northern Golaha, April 2007.

On the 1 November 2006 reconnaissance of the E periphery, good numbers and diversity of waterbirds were sighted, including Common Goldeneye *Bucephala clangula* and Darter *Anhinga melanogaster*. On 21 April 2007 Graceful Prinia *Prinia gracilis*, Smoky Warbler *Phylloscopus fulligiventer*, Yellow-crowned Woodpecker *Dendrocopus mahrattensis*, Sarus Crane and Common Babbler *Turdoides caudatus* were recorded from W Golaha habitats.

**3. Bajuwa Taal and other Tulsipur area marshes.** A c. 2 km herbaceous wetland, straddling the Nepal-India border and surrounding the small village of Tulsipur, Kapilvastu. Surveyed by circuitous transects in both 2006 and 2007.



**Habitat.** A perennial shallow lake of unknown origin with extensive surface cover of lotus and water lilies (Fig. 12). Heavily utilized by local communities for fishing and seasonal grazing by pigs. Set nets are staked to dry and seen to trap several birds which also rips holes the nets. Much of Bajuwa Taal was dry by 23 April 2007, with livestock grazing short grasses. Marsh to the W and NW of Tulsipur is evidently perennial. Water of 2-3 m depth was densely covered by lotus and water lilies (Fig. 13). Wild



Fig. 12. Bajuwa Taal, SE of Tulsipur, Kapilvastu. April 2007.

rice is protected and sustainably utilized north of Tulsipur, mainly as a cultural food for child-bearing women. The tops of stalks in seed are bound together to minimize loss to foraging birds (Fig. 14).



Fig. 13. Lotuses NW of Tulsipur, Nov. 2006. Fig. 14. Wild rice NW of Tulsipur, April 2007.

**Birds.** Of particular note in November 2006 were Little Cormorant, Sarus Crane, Tawny Pipit *Anthus campestris* and probable Buff-bellied Pipit *A. rubescens*. In April 2007 Grey-headed Lapwing *Vanellus cinereous*, Little Cormorant, Northern Pintail *Anas acuta*, Garganey *Anas querquedula*, White-rumped Vulture *Gyps bengalensis* and Sarus Crane were recorded.

4. **Banganga River grassland near the Nepal-India border.** Inner meander and riverine patches of herbaceous grassland, fallow fields and scrub 0-5 km N of the border in Kapilvastu district. Partially reconnoitered in April 2007.

**Habitat.** Patches of uniform grassland heavily utilized by local communities for thatch, fodder and grazing. Entirely cut by mid-April for local use (Figs. 15, 16). A patch of medium-height grass and thistle had regenerated from fallow condition in 2006 (Fig. 17). All grassland patches are erroneously depicted as scrub on the

1:25,000 topographic map of the area. Adjoining sisoo-acacia woodland and clumps of thorny shrubs form intact but small areas of scrub. The Banganga was reduced to stagnant pools and lagoons, and used for cast net fishing and to water and bathe livestock (Fig. 18).



Fig. 15. Cut and grazed grassland, lower Banganga, April 2007.

Signs of moderate disturbance by fishermen and fuelwood collectors were noted along the littoral.



Fig. 16. Stacked grass W of Itawa, lower Banganga River, Kapilvastu. April 2007.



Fig. 17. Recovering grassland and thistle, NW of Itawa, lower Banganga. April 2007.

**Birds.** A flock of 23 Sarus Cranes was observed at dusk on 22 April 2007. Local people said larger flocks sometimes passed by, presumably en route to nearby roosting sites, although these and any nesting were unknown. A few, only common and fairly common birds were recorded in cutover grassland, but Yellow-wattled Lapwing was observed in a grazed patch and several Little Cormorants in the water.



Fig. 18. Banganga south of Hardauna Ghat, Kapilvastu. April 2007.



5. **Kachaniya Khola scrub and grassland.** A steeply sided perennial stream mostly covered with tall grass, sedge and reeds; bordered by dry scrub, grassland and fields. Traversed in November 2006 and reconnoitered to the N in April 2007.

**Habitat.** Kachaniya Khola is depicted on the Chanauta and Bhalubari map sheets as a thin c. 20 km stream with steep banks from W of Dharamnagar to the Nepal-India border in Kapilvastu, and only sporadic indication of non-agricultural vegetation. None of the extensive uncultivated herbaceous vegetation W and SW of Dharamnagar is shown on the maps, but is discernable on zoom-in views of the Google Earth® satellite image of the area (POI: 27° 37.614' N 82° 52.325' E).

Marshy areas and mixed *simal* woodland SW of Dharamnagar were briefly traversed at midday in November 2006. A morning assessment farther N in April 2007 revealed a rich mix of tall grasses along steep banks, and a streambed nearly overgrown with patches of sedge, reed and grass (Fig. 19). Patches of tall grassland and short grass interspersed with emaciated dal bordered the W bank (Fig. 20).



Fig. 19. Kachaniya Khola, east of Dharamnagar, Kapilvastu. April 2007.

**Birds.** Brief midday observations in November 2006 were not conducive to adequate bird assessment. Early morning transects in April 2007 of a limited area produced a diverse array of scrub and grassland birds, and an overall total of 30 species. Good views were afforded of Slender-billed Babbler *Turdoides longirostris* perched high on a grass stalk. This Globally



Fig. 20. Kachaniya Khola grassland east of Dharamnagar. April 2007. Threatened species was heretofore known in Nepal only from Chitwan National Park (Baral and Inskipp 2004), and is inferred to have a small, rapidly declining

global population due to degradation and destruction of tall grassland habitat (Baral and Chaudhary 2006). The sight record of Slender-billed Babbler at Kachaniya Khola represents a global western extension of range (Cox in prep). Singing Bushlark *Mirafra cantillans* was recorded at the top of grassy banks along the Kachaniya (only the fourth locality for the species in Nepal). Smokey Warbler and Clamorous Reed Warbler were observed in littoral grasses, Common Babbler in adjacent scrub, and Tawny Pipit in nearby ploughed fields.

**6. Artificial ponds with dense peripheral vegetation.** Exemplified by one pond for water supply and aquaculture at Gulari (Thunhiya VDC), and another associated with a religious shrine at Shivalaya (Hathihawa VDC) in the terai of Kapilvastu. Each site was reconnoitered in November 2006 and April 2007.



Fig. 21. Densely fringed fish pond near Gulari (Thunhiya VDC), Kapilvastu. April 2007.



Fig. 22. Religious pond at Shivalaya (Hathihawa VDC), Kapilvastu. April 2007.

**Habitat.** The c. 1.5 ha pond at Gulari (Fig. 21) was constructed to provide water for livestock and fish rearing (carp and small endemic species). A dense mix of *simal* and other tall trees, spindly standing deadwood, and tall thickets draped with lianas grow on the banks. Short herbaceous plants line most of the littoral. The c. 1.0 ha pond at Shivalaya is less 'natural': cultivated species predominate and the banks are disturbed by grazing and cutting. Mangoes, ornamental shrubs, thickets and patches of grass are maintained (Fig. 22). The undergrowth of these ponds is dense, unlike most groves in the area, and set amongst an expanse of fields, comprises important and rarely encountered cover for sedentary birds.

**Birds.** Higher bird diversity was evident in spring. The pond at Gulari showed relatively high diversity of birds in the afternoon of 25 April 2007. Twelve mostly common and fairly common species were recorded 15h30-17h05, including Wood Sandpiper *Tringa glareola* and a male Eurasian Golden Oriole *Oriolus oriolus* carrying nest material. Thirteen common and fairly common species were recorded at the Shivalaya pond in the late morning on 20 April 2007.

**7. Mango and mango-sisoo orchards in Kapilvastu.** No specific examples are cited, but this habitat type was well-represented on transects, often as lunch stop sites away from villages. In Kapilvastu there are probably hundreds of these groves ranging 0.3->3 ha in area; some on transects were not shown on the topo maps; some of these were evidently planted after baseline data for maps were obtained.

**Habitat.** Usually occurs as a tree monoculture of mangoes (Fig. 23), or mixed with sisoo, other hardwoods and bamboo. Understorey varies from nearly intact (unburnt and bushy with grasses) to vacant but is usually much affected by grazing, processing of grain and for shade and rest. Nonetheless, tree cover, foraging habitat and suitable nesting habitat appear to be important for many local birds. The dense leafy canopy of mango trees seems suitable for nesting by many passerines. Where sisoo is planted taller trees accommodate raptor (and other?) nests.



Fig. 23. Mango-sisoo grove west of Dharamnagar, Kapilvastu.

**Birds.** Large Grey Babbler, listed as local and frequent in the western terai (Grimmett *et al.* 2000) was observed in winter and spring in the Kapilvastu terai to be fairly common and prefer mango orchards with a dry open understorey. Parties of 5-7 birds slowly flicked through leaf litter under mango trees and occasionally foraged in sisoo mixed with mangoes. Most bird species associated with this habitat are generalist gleaners and small raptors using treetops to nest or watch for prey.

**8. Surahi Khola sisoo and riverine scrub.** A riverine complex in northern Kapilvastu of degraded and heavily degraded vegetation: steep banks with thickets, grass and shrubs (Fig. 24) and intensively grazed inner meanders of remnant grassland. Bordered N of Mahilwar by a patch of sisoo forest with unusually tall and bushy understorey (Fig. 25). Flow largely siphoned off in all seasons for irrigation. An important, long fragmented strip of non-arable land and perennial water. Steep sandy banks good for hole nesting species, particularly bee-eaters, martins and kingfishers. Reconnoitered in November 2006 and April 2007.



Fig. 24. Surahi Khola banks, Kapilvastu. April 2007.

**Habitat.** Mostly chopped over scrub on steep banks behind a muddy littoral. Greatly reduced water flow in winter, even more so in spring. Ecological effects unknown. Signs of frequent cutting and grazing. Entire area is unsuitable for agriculture due to flooding in the monsoon and possible inundation in winter. An



adjoining patch of tall sisoo contained an unusually dense understory of tall shrubs, *ber* and grasses, and was said by local residents to be unplanted.

**Birds.** In moist bank vegetation, Clamorous Reed Warbler *Acrocephalus stentoreus* and Striated Babbler *Turdoides earlei* were recorded in November 2006. Common Babbler *Turdoides caudatus*,



Fig. 25. Sisoo-acacia grove, W bank Surahi Khola. April 2007.

Booted Warbler *Hippolais caligata* and Indian Robin *Saxicoloides fulicata* were observed in peripheral dry scrub and grass. Sirkeer Malkhoa *Phaenicophaeus leschenaultii* and Rufous-tailed Shrike *Lanius isabellinus* (very rare winter visitor: Grimmett *et al.* 2000) were noted at the sisoo patch edge. A flock of six Great Cormorant *Phalacrocorax carbo* fished at one of the few deep pools in the Surahi in November. A female Kessler's Thrush *Turdus kessleri*, listed as an erratic winter visitor to highland Nepal (Grimmett *et al.* 2000) was observed at dusk on 26 April 2007. If confirmed, the record would be the first from lowlands on the Subcontinent and a western extension of range for the species.

#### 9. Mixed broadleaf forests, southern base of Churia Hills, Kapilvastu.

Mixed sal other evergreen broadleaf trees with a substantial deciduous component and fairly open understory along the southern base of the Churia Hills in northwestern Kapilvastu district. Reconnoitered in November 2006 and April 2007.

**Habitat.** Fairly dense mixed broadleaf forests dominated by *sal* away from watered ravines often with a substantial canopy and middle storey of deciduous species. Lianas are common but epiphytes few and small. Densest adjoining the east bank of the Chirai Khola (= Bird River) W of Ramodahawa, Kapilvastu. Heavily grazed and foraged for fuelwood, especially near Ramodahawa,



Fig. 26. Evergreen woodland west of Ramodahawa, Kapilvastu. November 2006.

(Fig. 27) where almost woodland in character (Fig. 26), but a denser understory and increasingly intact, larger tree component occurs gradually westwards. Some burning of ground cover in *sal* dominated forest, evidently to create additional grazing habitat for livestock, was noted in spring and winter. In late April 2007 flowing water was limited to side streams of the Chirai.

**Birds.** In November 2006 relatively high diversity and several rare species were recorded. Black Baza *Aviceda leuphotes* was noted particularly late in the year. Vernal Hanging Parrot *Loriculus vernalis* paused in the canopy of a tall tree, yielding only the fourth confirmed record of the species in Nepal and first in 40 years. In April 2007 Brown-headed Barbet *Megalaima zeylanica* was recorded, an eastern extension of range for the species in Nepal.

**10. East and west arms of the far upper Chirai Khola.** A perennially watered stream wending through steeply dissected and well-forested sandstone hills of the Churia Range in NW Kapilvastu (Figs. 28, 29). Valleys sparsely populated with small hamlets. The same route was followed in November 2006 and April 2007.



Fig. 27. Fuelwood collectors W of Ramodahawa. Nov. 2006.



Fig. 28. View east from summit of peak 817m, Chirai Khola, Kapilvastu. November 2006.

**Habitat.** The far upper Chirai is a shallow stream with sandy and boulder-strewn littoral (Fig.30). Local fishermen met in the Chirai said only a few small fish and crabs persisted. Poison (derris roots and leaves?) had purportedly been used in the recent past, and larger fish were no longer caught or considered present. The idyllic stream course passes through eroded sandstone cliffs, except near its headwaters where less canyon-like and more densely forested country is drained.

The hills bordering the far upper Chirai are regularly burnt. The more exposed S and E aspects are in mixed and pure open stands of pine and *sal* forest.

Grassy slopes predominate where undisturbed by landslips or burning. Ravines harbour the densest forest, composed of mixed evergreen broadleaf fingers, lianas, some *ningalo* bamboo, ferns and various herbaceous plants, including a few wild bananas, in the dim and tangled understory. Where *sal* occurs as a substantial component evidence of burning in the understory is usually present.

Shotgun blasts emanating from surrounding hillsides were occasionally heard on both the winter and spring passages in the upper and far upper Chirai.

**Birds.** Surprisingly few in winter. More diversity and abundance was noted in spring. Stream water levels did not vary much between winter and spring. In dense understory several babbler distributed rarely in west Nepal or heretofore only in the east were recorded:

Black-chinned Babbler *Stachyris pyrrhops*, Grey-throated Babbler *Stachyris nigriceps* and Puff-throated Babbler *Pellorneum ruficeps*. Pale-chinned Flycatcher *Cyornis poliogenys*, previously known in Nepal only farther east, was common in spring along the Chirai at 400-500 m.



Fig. 29. Upper Chirai Khola ravine forest NW of Siddhapairo, Kapilvastu.

Several lowland species listed as uncommon or rare in western Nepal (G. *et al.* 2000 refers) were regularly recorded in the Chirai forests: White-browed Fantail *Rhipidura aureola*, Indian Pitta *Pitta brachyura*, Brown-capped Pygmy Woodpecker *Dendrocopos nanus*, and Asian Paradise-flycatcher *Terpsiphone paradisi*. Black-backed Forktail *Enicurus immaculatus*,



Fig. 30. Upper Chirai Khola streambed. May 2007.

frequent from W-C areas eastwards but very uncommon in the west (Grimmett *et al.* 2000) was common along the Chirai and side streams. In winter a singing Pygmy Wren Babbler *Proopyga pusilla* was heard at its altitudinal minimum in Nepal. Other uncommon species included Changeable Hawk Eagle *Spizaetus cirrhatus*, Rufous Woodpecker *Celeus brachyurus*, Rosy Minivet *Pericrocotus roseus*, Banded Bay Cuckoo *Cacomantis sonneratii* and Pin-tailed Green Pigeon *Treron apicauda*.



### 11. Masot Khola forests in the Churia Range of Dang Deukhuri.

The Masot Khola drains a well-forested east-west valley in the inner Churia Range of Dang Deukhuri. The headwaters of this pastoral and picturesque valley are traversed by the Arjunkhola-Gorahi paved road. An eight linear km section was traced in May 2007 when flow was clear and shallow.

**Habitat.** The valley bottom is a mosaic of small scattered villages, hamlets, fields and small grazing grounds (Fig. 31). Proximate broadleaf forests and deciduous tracts on surrounding slopes are mostly intact and dense (poorly depicted on the Satbariya topo sheet). Evidence of burning in winter was noted on many of the higher slopes, in addition to more recent setting of fires along drier aspects in the understory of the middle and upper Masot. Most side ravines, however, seemed unaffected by fire. Dense short strips of broadleaf forest enwrap the steeply walled ravines and sections of the upper Masot. Hill slopes were typically less steep than the outer Churias, which favors formation of denser forest (Fig. 32).



Fig. 31. Ragutara, Masot Khola.



Fig. 32. Mixed deciduous forest at 750 m, Churia Range S of Masot Khola, Dang Deukhuri.

**Birds.** Although weather was fairly poor on our one day passage, relatively high species diversity was noted. Uncommon species included Crested Goshawk *Accipiter trivirgatus*, Bonelli's Eagle *Hieraetus fasciatus*, Banded Bay Cuckoo *Cacomantis sonneratii*, Crow-billed Drongo *Dicrurus annectans*, Indian Pitta *Pitta brachyura* and Asian Brown Flycatcher *Muscicapa dauurica*.

**12. Rapti River grasslands, Dang Deukhuri.** A large tract of tall uniform grassland and river braids extending c. 10 km along the central Rapti Nadi, and 0.5-1.5 km in width. Bordered ubiquitously by cultivation. The same east-west route was followed in November 2006 and May 2007.

**Habitat.** Tall riverine grassland on the N and S banks of the Rapti and its large islands. The grasses are almost completely harvested by local people in early winter (Fig. 33) for thatch and fodder. Species associations are not yet identified. At least eight user groups organized at the VDC level are involved in grassland management.

The Rapti is not yet dammed; winter and spring

flows are at similar levels. Intensively fished and grazed by local communities. By 4 May 2007 the only remaining tall vegetation was cutover patches (Fig. 34), isolated tufts of tall grass and trampled reed beds (Fig. 35).



Fig. 33. First cuts of grass in winter, Rapti Nadi south bank, NE of Dharampur, Dang Deukhuri, November 2006.



Fig. 34. Cutover grassland, S bank of Rapti Nadi N of Parsiya, Dang Deukhuri, May 2007.

**Birds.** The Rapti grasslands are much larger than Khadara Phantha, but reduced diversity of birdlife was evident. A morning excursion on 4 May in good weather yielded relatively low bird diversity. The only uncommon species recorded was Wood Sandpiper. In November 2006 Short-eared Owl *Asio flammeus*, Bright-

headed *Cisticola exilis*, Tawny Pipit *Anthus campestris* and Greater Spotted Eagle *Aquila clanga* were noted. A Jungle Prinia *Prinia sylvatica* in non-breeding plumage was observed at length on 13 November 2006, which represents an eastern extension of the species' range in Nepal.



Fig. 35. Grazed reed bed, Rapti Nadi S bank, N of Dharampur, Dang Deukhuri. May 2007.

#### Additional areas.

Other sites in Kapilvastu and Dang considered potentially important for biodiversity conservation, emphasizing a landscape approach, were reconnoitered in 2006 and 2007. These sites were subsequently deemed of lower priority for conservation action than the 12 critical sites. A summary of each follows:

1) *Mixed sal forest to the S of the Rapti* appears dense and rather uniform from the East-West Highway, but ground-truthing transects revealed serious degradation. No legend is given on the Lalmatiya topo sheet for two shades of green encompassing the area. Almost all of the tall *sal* trees have been removed from the *terai-bhabar* forest, and some old cutting extends into foothill spurs. Local people said most cutting occurred 10-15 years ago and that outside *thulo manchhe* (important persons) organized the cutting and transport. Transects showed that *sal* is quickly regenerating in the *bhabar* and inner *terai*, but cutting for poles and charcoal continues, and moderate pressure is exerted by fuel wood collection. A mixed flock of Tickell's Thrush *Turdus unicolor*, rarely reported in winter in Nepal (Grimmett *et al.* 2000), was observed in the understory of *sal* scrub on 12 November 2006.



Fig.36. Scrub sal S of the Rapti, Dang Deukhuri.



Chopped over forest grades to open woodland with tall bushes towards village peripheries to the north. A pair of Tickell's Blue Flycatcher *Cyornis tickelliae* was observed at 315 m, just above the species' maximum altitude in Nepal of 305 m (Grimmett *et al.* 2000) on 3 May 2007. Unknown species of quail, Grey Francolin and Red Junglefowl *Gallus gallus* were fairly common in this area in May 2007, suggesting that hunting was rarely or not practiced in the recent past.



Fig. 37. Grazed woodland and scrub SE of Jethangau, Rapti valley, Dang Deukhuri. May 2007.

2) *Dang inner terai (Tulispur-Gorahi)*. Extensively converted for agriculture. Few trees and groves away from villages. Stream and river banks are more degraded of shrubs and grasses than in Kapilvastu. Fewer plantings of sisoo, although a Care Nepal project NE of Basantapur has reforested >100 ha with healthy sisoo. As part of the same initiative, severely striped and eroded badlands at the northern base of the Churias SE of Basantapur have been set aside for regeneration (neither of these is shown on the Satbariya topo sheet). Tall sisoo and acacia with a fairly dense understory now grow in and border the steep ravines (Fig. 38). A relatively high diversity of bird species was noted in the late afternoon of 7 May 2007 including Bay-backed Shrike *Lanius vittatus*.



Fig. 38. Regenerating sisoo-acacia SE of Basantapur, Dang Dekhuri. May 2007.

3) *Sakhubir Taal*. A c. 700 m<sup>2</sup> artificial reservoir constructed several decades ago in the N-C terai of Kapilvastu NW of Banagai (Fig 39). Inflow has been severely restricted since 5-7 years ago resulting in formation of a central perennial marsh with open water (as shown on the topo map), but otherwise largely converted to fields in the western third, and elsewhere reduced to seasonal marsh dominated by invasive plants. Water of other canals and the Bel Khola linked to Sakhubir were said to have been diverted to irrigate fields to the NW. Local government was said to be leasing and selling land inside the reservoir for local people to cultivate.



Fig. 39. Southwest corner of Sakhubir Taal, Kapilvastu. November 2006.

4) *Banagai*. A burned palatial estate of a teacher of the royal family (Fig. 40). In November 2006 the ruins were inhabited by a pair of Barn Owl *Tyto alba*, which is uncommon and local in Nepal (Grimmett *et al.* 2000), with few reports from Kathmandu valley or other areas in recent years (H. S. Baral, *pers. comm.*; C. Inskipp, *pers. comm.*). A colony of seven White-rumped Vulture *Gyps bengalensis* was roosting in a tall *pipal* tree at the secondary school in November 2006, and included two juveniles and one adult on a nest. In April 2007, nine Eurasian Griffon *Gyps fulvus* were noted in the Banagai village area, one on a nest near the palatial ruins, another nesting in the *pipal* tree at the school, and  $\geq 1$  White-rumped Vulture.



Fig. 40. Ruins of Banagai residence, W of Taulihawa, Kapilvastu. November 2006.

BCN's 'Globally Threatened Birds of Nepal' and vulture conservation posters was distributed at twelve schools (Fig. 41), or care of persons near closed schools, in Kapilvastu and Dang Deukhuri. At some schools a short talk was given on explaining the posters, the objectives of bird and habitat reconnaissance, biodiversity conservation, and the functions of BCN and WWF-Nepal. Questions were encouraged and feedback requested of views on conservation and rural development, in particular how local communities could be incentivized to act.



Fig. 41. Sri Haribas primary school, Rupendehi. November 2006.

In general, the open terai of Kapilvastu is not nearly as dry and scrubby as 30 years ago (*pers. obs.*). The least cultivated areas are located in some of the remotest and most underdeveloped areas, particularly along the Nepal-India border as seasonal/perennial marsh and scrub, and elsewhere bordering local *kholas*. These important sites for habitat and biodiversity conservation in the Kapilvastu *terai* often overlap with some of the poorest rural communities in the district.



Fig. 42. Bullock cart and crew, Balarampur, Kapilvastu. November 2006.

**Sarus Crane** *Grus antigone*, listed as a declined and endangered species in Nepal (Baral and Inskipp 2004), was noted as fairly common throughout open *terai* in Kapilvastu. Sixty-eight birds were counted 16-27 April 2007, 62 of which are regarded as possibly distinct individuals. Some birds in the flock of 23 observed on 22 April in the lower Banganga may represent duplicate sightings. Only 14 records ( $\geq 12$  individuals?) were obtained in early winter 29 October to 4 November 2006, with considerably reduced effort and coverage.

The cranes observed in early winter were feeding mostly in fields of ripening grain. By contrast, birds in April largely avoided fallow fields and stubble to feed in marshy patches and muddy depressions, and near Taulihawa where irrigation is better developed, in rarely encountered fields of ripening grain. Except for large flocks in the lower Banganga and SW of Taulihawa, most birds were in pairs. Presumed family groups of three each were noted on three occasions. A carcass of an adult was found in a fallow field N of Gauthihawa on 23 April 2007. Local people alleged that jackals pursued and sometimes killed Sarus Cranes. No features of any observed birds indicated immature plumage, but some individuals were viewed at long distances where head pattern was difficult to discern.



Fig. 43. Adult Sarus Crane, N of Amarigau, Rupendehi. April 2007.

Sarus Cranes were usually not wary and tolerated an approach within 20-30 m before walking away. One individual was observed feeding in khets at c. 15 from a farmer cutting ripened rice N of Amari, Rupendehi. The species was not recorded in the Dang Deukhuri inner valleys. Older local people met there were unaware of cranes occurring in either valley.

In the Kapilvastu *terai*, local communities believe that harming a *sorus* will afflict three generations of family members with horrible diseases (Cox 2007). The species is not hunted and no evidence of birds being kept as pets was obtained on transects, unlike 30 years ago when the practice was occasionally noted.



Fig. 44. Sarus Cranes E of Sano Jamuni, Kapilvastu, November 2006.

**Vultures.** The diversity and abundance of vultures in Kapilvastu and Dang Deukhuri were low in comparison with sightings from 28-30 years ago. Five species were recorded: Eurasian Griffon *Gyps fulvus*, White-rumped Vulture *G. bengalensis*, Egyptian Vulture *Neophron percnopterus*, Red-headed Vulture *Sacrogyps calvus* and Cinereous Vulture *Aegyptius monachus*.



No records of Long-billed Vulture *G. indicus* resulted. The species has declined in recent years, evidently due to high ingestion of dichlofenac from cattle carcasses (reference). White-rumped Vulture was the most numerous of vultures noted in November 2006 (17 of up to 27 individuals comprising four species), and has declined sharply in recent years (Grimmett *et al.* 2000). In April-May 2007, White-rumped was also the most abundant vulture: 50 of up to 104 individuals comprising four species). On winter and spring transects Eurasian Griffon was the second most abundant vulture. Nesting sites of that species and White-rumped are protected at Banagai. Residents of Thulo Jamuni, Kapilvastu lamented the scarcity of vultures in recent years, saying the air around area villages was, unlike in the past, often foul from the stench of uneaten carrion.

Transects of cultivation produced low bird diversity and abundance. This was particularly so for rice fields in the periphery of Taulihawa, where pesticide use seems more prevalent than in other areas of Kapilvastu. Common Quail *Coturnix coturnix* was recorded on several occasions (assuming Rail Quail is locally extinct) in the vicinity of the Nepal-Indian border, and Yellow-legged Buttonquail *Turnix tanki* was observed in ripened wheat W of Khadara Phantha in April 2007.



Fig. 45. Rice field border, Kapilvastu.

**Additional records of rare and scarce birds.** Other sites reconnoitered in Kapilvastu and Dang Deukhuri produced the following rare and scarce species:

Lesser Fish Eagle *Ichthyophaga ichhyaetus*. A perched adult N of Bakarmodja, Kapilvastu on 27 April 2007 overlooking an exposed stream at the *terai-bhabar* ecotone (Fig. 46) W of the Surahi Khola at 145 m. Categorized as a rare and local resident below 250 m in Nepal, noted mainly at Chitwan National Park (Grimmett *et al.* 2000); unrecorded in Nepal in recent years (H. S. Baral, *pers. comm.*).



Fig. 46. Stream north of Bakarmodja, Kapilvastu.

Indian Pitta *Pitta brachyura*. At least 16 individuals heard in the upper Chirai Khola, Kapilvastu and Masot Khola/Simmuwa Danda, Dang Deukhuri 29 April - 7 May (350-850 m), plus a pair observed in courtship in the upper Chirai. Common at Chitwan but rare elsewhere in Nepal (Grimmett *et al.* 2000).

Rusty-tailed Flycatcher *Muscicapa ruficauda*. One at the unusually low altitude of 545 m, upper Bakram Khola, S base Churia hills in Kapilvastu. Listed as a uncommon summer visitor and passage migrant (Grimmett *et al.* 2000).

Booted Warbler *Hippolais caligata*. One bird at Banagai, Kapilvastu on 25 April 2007 and another in sisoo-acacia at the Surahi Khola, Kapilvastu on 27 April. A scarce winter visitor and passage migrant in Nepal (Grimmett *et al.* 2000).

Rufous-tailed Lark *Ammomanes phoenicurus*. An unwary bird singing perched and high in display (?) flight, then fluttering down to the same perch; 6 km W of Taulihawa, Kapilvastu on 4 November 2006. Rare and local resident in the western terai (Grimmett *et al.* 2000).

Citrine Wagtail *Motacilla citreola*. A second year juvenile W of Sakhubir Taal, Kapilvastu on 5 November 2006. Two males in breeding plumage along Banganga River littoral S of Hardauna Ghat, Kapilvastu, 23 April 2007. In Nepal, the species is fairly common at Koshi Thappu and Chitwan but there are only scattered records from elsewhere (Grimmett *et al.* 2000).

Tawny Pipit *Anthus campestris*. At least six birds recorded from two localities in Kapilvastu 31 October - 2 November 2006, and by the Rapti River in Dang on 13 November 2006. A pair noted on 26 April 2007 E of Dharamnagar, Kapilvastu. Listed as a vagrant to Nepal by Grimmett *et al.* (1998); subsequently considered a rare winter visitor below 305 m and passage migrant (Grimmett *et al.* 2000). Additional records from lowland Nepal have been regularly received in recent years (H. S. Baral and C. Inskipp, unpubl. data/ pers. comm).

Notably absent from the winter and spring surveys was Southern Grey Shrike *Lanius meridionalis*. In 1976-1978 this species was fairly common in dry patches of scrub in the *terai* of southern and central Kapilvastu (pers. obs).

## Discussion.

**Habitat.** Surveys of the Churia Range in Kapilvastu and Dang Deukhuri confirmed that mixed subtropical forests occur in minimally disturbed tracts and face only minor conservation threats. However, forests in the *bhabar* of the Rapti River watershed have been reduced by logging and fuelwood pressure to woodland and scrub. Substantial fragments of scrub and degraded but functional wetlands were identified in the *terai* of Kapilvastu and along the Rapti. Each of these habitat types is crucial to ecosystem conservation and the socio-economic welfare of local communities. Devising community-based initiatives to preserve, restore and enhance habitat, and in turn re-establish a robust ecosystem, is a long-term, complex challenge for the TAL programme.



Fig. 47. Fishing weirs and rock collection, Rapti River.

Transects showed numerous inaccuracies on the 1:25,000 topographic maps of Kapilvastu and Dang. 'Dense forest' no longer occurs in the *bhabar* and inner terai south of the Rapti. Vegetation type is not given for important areas of scrub in Kapilvastu (e. g., Kachaniya Khola). Remnant grassland and smaller patches of grass are depicted only as scrub. These habitat types and borderland marsh appear substantially reduced in area compared to that indicated by the maps and observations made by the author 28-30 years ago. Since then and subsequent to production of the maps, a burgeoning local population has led to much larger villages and new settlements. Construction of additional motorable tracks and link roads has also occurred.

By contrast, many small groves of mango, sisoo and acacia are not shown on the maps. Some younger orchards were planted after aerial photography for the maps was flown in 1990. There is pressing need for additional ground truthing in Kapilvastu and Dang (and expansion to Rupendehi) to better discern landscape attributes, impact of local communities, the scale and importance of economic benefits derived from land use, and practical modalities for conservation.

**Human interaction and impact.** Although a detailed socio-economic survey was not conducted on transects, a basic understanding of rural economies was achieved from informal interviews and observations.

The 12 sites identified as critical to maintaining biodiversity represent the range of available habitat types. Most sites are intensively utilized by local communities to meet their basic needs. Those in the least disturbed condition are the Churia hill forests, comprised mainly by expanses of broadleaf deciduous associations, but include fingers and fragments of evidently more diverse broadleaf evergreen forest. Fire is used extensively in spring to open up the understory for grazing. Fires set along stream bottoms and around settlements usually spread to burn entire hillside understoreys of tolerant deciduous forest, and sometimes invade evergreen vegetation. To what extent recurrent burning depresses formation of more diverse yet poorly distributed evergreen forest is unknown. Similarly, forests at the base of the Churias in Kapilvastu and Dang are degraded by fuelwood collection, and understory vegetation near villages is intensively grazed.

Grassland is used intensively for production of thatch, fodder and subsequent grazing of livestock. Community user groups in the Rapti coordinate cutting and distribution of thatch. Much (most?) of the material is shared to construct roofs of local residents' houses, but at least some is sold to more distant communities, which provides much needed income for food security and basic development needs (e. g., tools, clothing, school fees, medicine).

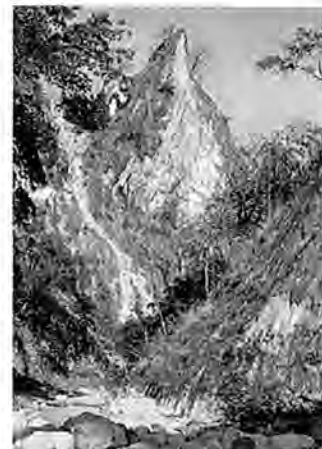


Fig. 48. Upper Chirai Khola.



Fig. 49. Rapti River grassland W of Dharampur, Dang Deukhuri. May 2007.



Conversion of scrub to cultivation (mainly for rice, wheat, lentils and mustard) is most apparent in the Taulihawa vicinity, where irrigation schemes now allow circa-annual agricultural production. Sugarcane is cultivated in some non-irrigated areas (e. g., S and E of Dharamnagar) and additional brick factories (Fig.50) put further pressure on local scrub and woodland. Irrigation and to a lesser extent the use of chemical fertilizers has resulted in less fallow land than 30 years ago.



Fig. 50. Acacia timber at a brick factory W of Dharamnagar, Kapilvastu. April 2007.

The increased use of pesticides in Kapilvastu is unstudied and likely detrimental to insect populations and insectivores. A survey of pesticide outlets (often found as part of agricultural supply shops) is needed to determine the kinds of pesticides available, whether these are legal or banned, their effects on the local environment, trends in sales/use, and identification of benign alternatives (e. g., organic farming methods, biological control, integrated pest management).



Most of the critical grassland and wetland sites in Kapilvastu are located in the remotest areas of terai in the district, near the Nepal-India border. Coincidentally, these areas are where the poorest of the poor live. Most local people are low caste Hindus or Muslims who are landless and indentured, and subsist on a share of harvests by tending the fields and livestock of *zamindars* (wealthy landowners). These outlier traditional communities have been largely neglected by government and aid agencies, although they have as much a human right to development as others, and are demonstrably in greater need. These communities are ideally positioned to lead conservation-based management of natural resources.



Figs. 51 and 52. Infested dal S of Mahuwari, N bank Koti Khola, Kapilvastu. April 2007.

**Birds.** Unusual records noted at the twelve critical sites indicate the extraordinary diversity and high value of local birdlife. A detailed account of all species recorded is in preparation and will elaborate this. Surveys in 2006 and 2007 traversed two of Nepal's Important Bird Areas (IBAs):

Farmlands in Lumbini Area. An expanse of agricultural land in Kapilvastu and Rupendehi including wetlands, scrub and grassland that encompasses Lumbini, the birthplace of Lord Buddha. The IBA is particularly known for various endangered vultures and the common occurrence of Sarus Crane (Baral and Inskipp 2004).

The Lumbini Crane Sanctuary was established in 1995 to demonstrate wetland management and conservation education. Several wetlands have been constructed in the 100 ha Lumbini Development Trust area and conservation awareness activities initiated (Suwal 2002). Sarus Crane was formerly fairly common in the Lumbini area (Suwal 2002) but has declined in recent years (Cox and Giri 2007), while breeding has not been observed or reported (D. Giri, BCN, pers. comm.). Severe degradation of grassland has occurred throughout the Trust area from overgrazing of local livestock and disturbance by visitors (pers. obs.).

Transect results in 2006 and 2007 suggest that more suitable habitat for cranes and many other terai birds occurs further west and that the IBA should be expanded to include fields, wetlands, scrub and grassland patches as far as the western flanks of the Kachaniya Khola.

In Rupendehi district, the Community Managed Wetlands Project has employed a community-participatory approach to promote sustainable use of key local wetlands by income generation schemes (Baral and Inskipp 2004). BCN is conducting socio-ecological studies and conservation awareness activities in the Lumbini area (birdlifenepe.org ref). The results of these two initiatives, especially the lessons learned, should be made available to assist design and implementation of similar initiatives in Kapilvastu, Dang and other districts in the TAL area.

Ornithologists recently visiting peripheral lands of the Lumbini area in winter have highlighted the diversity and abundance of raptors, in particular spotted eagles (Mallalieu 2007), and the diverse range of open country birds, many of which are supported by traditional farming methods (small fields with grassy bunds). Maintenance of a mosaic of habitats: cultivation, scrub, grassland and wetlands provides a variety of food resources, cover and roosting sites (Hanlon and Giri 2007). Sarus Crane was commonly observed and included an unusually large flock of 21 (Hanlon and Giri 2007). The results of transects in Kapilvastu in October-November 2006 and April 2007 also demonstrate these attributes.



Fig. 53. Rice fields SW of Lumbini.

Dang Deukhuri Foothill Forests and West Rapti Wetlands. Mixed forests in the Churia Hills and expanses of grassland associated with the Rapti River in Dang Deukhuri are especially important for birds. Prior to transects by the author, almost nothing was known (to outsiders) of birdlife and habitat condition in this IBA, due in large part to the security situation (Baral and Inskipp 2004).

Transects showed no indication that 'forests are being lost at a phenomenal rate' (Baral and Inskipp 2004). Most of the cutting is restricted to the *bhabar* and terai zones and was carried out many years ago. Churia forests appear mostly intact although some cutting of trees on low spurs at the base has occurred in the recent past. These forests are important for wintering migrants (both vertical and horizontal), and to a lesser degree, resident species including breeders.

The incipient regeneration of mixed sal forest along transects south of the Rapti and recent delegation of management authority to local user groups offers the opportunity to rehabilitate these lowland forests for the mutual benefit of birds, biodiversity and local people.

Birds of extensive grassland associated with the Rapti floodplain are less diverse than at sites such as Khadara Phantha. The reasons for this are unclear but may relate to more uniform species composition, the lack of proximate scrub, overgrazing and greater human disturbance.

The effect on local birdlife of cutting virtually all the tall grass along the Rapti, and until recently at Khadara Phantha, is unknown. Setting aside of even small areas of grassland in the Rapti grassland may benefit resident and migratory birds and need not deprive local people of economic benefits. A study could be designed and undertaken with the active participation of local user groups and communities. Remuneration could act as an effective incentive for participation, compensate local residents for loss of income or materials, and help them satisfy their basic economic needs.



Fig. 54. Rapti River grassland. NE of Dharampur, Dang. November 2006.

### **Conservation needs**

None of the reconnoitered areas is gazetted as a protected area (*e. g.*, Conservation Area, National Park, Buffer Zone or Wildlife Reserve). Forests of the Churia Hills are classified as Protection Forest but there appears to be almost no monitoring or enforcement by the district or national government.

Most of the non-montane land is privately owned, usually by zamindars as large agricultural blocks. Much (most?) of the non-agricultural land in the Kapilvastu terai and Dang inner terai is managed by local communities under usufruct agreements for grazing, fuelwood collection and timber (poles). This pattern of land tenure implies that collaborative conservation efforts should be targeted to private landowners and community user groups. Involvement of other stakeholders such as local NGOs and government agencies, especially local offices concerned with natural resource management (*e. g.*, district offices of Irrigation, Agriculture and Forestry; VDCs) is essential to attain consensus and a practicable, integrated approach to conservation and development.



Fig. 55. Tharu woman and daughters, Mahadewa, Rapti River valley. May 2007.



A much better understanding of socio-economic factors in the study area is needed. The rapid conduct of appraisal surveys did not budget adequate time for discussions with village groups or representatives. Future surveys should prioritize time in the vicinity of critical sites to seek local knowledge of the environment and a profound understanding of local people's needs.



Fig. 56. Dharmanagar elder.

Lentic wetlands in Kapilvastu deserve special attention. Serious flooding during the monsoon caused by the dams on the Indian side of the Nepal-India



Fig. 57. Golaha wetland W of Hatihawa, Kapilvastu. November 2006.

border has led to calls in the Nepal mass media for the dams to be demolished (reference). This might mitigate seasonal flooding but could result in conversion of scarce wetlands for agriculture, lack of water for local irrigation in dry months, and loss of local and regional biodiversity. Management of land and especially water in the upper reaches of associated lotic systems may greatly influence maintenance of wetlands in the border region. Critical wetland sites identified and reconnoitered in this assessment should be considered as high priority for further research as part of an *in situ* wetlands conservation initiative by WWF and BCN in the TAL region.

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An approach based on the principals and techniques of Participatory Rural Appraisal (PRA) is considered integral to a community-based conservation effort. Outsiders emphasize listening to local people and asking open-ended questions to gain local knowledge in land use and to understand local socio-economic needs. Local people may lack high standards of formal education but possess a wealth of knowledge, especially on the local environment. Most importantly, PRA helps elicit intriguing ideas from local communities on how they can satisfy their development aspirations and simultaneously resolve unsustainable practices and enhance local biodiversity.



Fig. 57. Girl and cow dung, Kapilvastu. November 2006. The rationale and techniques of PRA are elaborated in Appendix 1.

Working closely with local communities and regular monitoring of conservation sites selects for dedicated personnel who are willing to base themselves at the village level, travel frequently in rural areas, and liaise closely with local communities, authorities and other stakeholders. Skills at connecting people and building relationships become more valuable than scientific expertise.

Travel near the Nepal-India border has been a sensitive matter in recent years. At present, one is free to walk within 10 m of the border. This is the edge of *das gaja*, or 'no man's land', a 10 m forbidden zone on either side of the border. A visit to Nepalese and Indian authorities at the nearest border post is highly recommended prior to field work. Security commanders can be briefed on project activities, and researchers informed of local security matters and contingencies. The presence of patrols and posts can add to one's security if security personnel know individuals or teams are in the vicinity.

Much of Kapilvastu underwent a spate of politically inspired sectarian violence in September 2007. Appeals for communal harmony and tolerance by civil society leaders and political parties helped bring the situation under control. Since then relative calm has prevailed in the district.

The Nepal-India border area in Kapilvastu has an outside reputation for cross-border crime, but specific incidents in the recent past could not be cited by local people in November 2006 or April 2007. Local authorities and residents considered the area safe and the people met were invariably friendly, helpful and hospitable. They seem unaccustomed to outsiders being interested in their welfare and were easily engaged for frank discussions. In a changing socio-political landscape the prospects for community-led initiatives are suddenly bright and as deserving as ever.



Fig. 57. Barkul schoolboy, Kapilvastu. April 2007.

Khadara Phantha. Bird counts in grassland and scrub showed that Khadara Phantha is by far the most diverse grassland for birds, even though the area is much smaller than the Rapti grassland or patches along the lower Banganga. The extent and diversity of peripheral scrub, old fields and riverine forest bordering Khadara likely explains this. Additional surveys in each season are needed to adequately inventory birds, to better understand sub-habitat types and their interrelationships, and the ways and importance to local people of natural resource use.



Fig. 58. Birding at Khadara Phantha. October 2006.

Appeals for urgent action to conserve this unique grassland (Cox 2006, Cox and Giri 2007) have yet to be acted upon. Continued expansion of cultivated grassland in winter and increasingly intensive cutting of riverine vegetation directly threaten this biodiversity hotspot. Immediate action is needed by WWF and BCN to collaborate closely with the landowning family to devise a short-term strategy that, at a minimum, limits conversion of the phantha to the existing area and preferably curtails it. Khadara Phantha is a high diversity patch of terai grassland, arguably Nepal's most endangered habitat type, especially outside protected areas.

Even greater urgency is indicated to halt the cutting of forest along the Koti Khola. At the current return of only Rs. 2/kg for fuelwood, the small amount of money needed to lease and guard the area for multi-faceted research would be an

investment in the future for all concerned. A leasehold arrangement would also buy time to develop a longer term program that incorporates additional economic incentives that mutually support conservation and local livelihoods (e. g., niche market paper production, ecotourism, inland fisheries, vegetable production, alternative income generation schemes).

Further degradation of such an important and easily worked site as Khadara Phantha would reflect negatively on the capabilities and vision of WWF and BCN. The costs of inaction are mounting, and further degradation will likely be more expensive and time consuming to repair.

In addition to regular monitoring of identified critical sites, initial assessments of the following areas should be included in future surveys by/with WWF and BCN fieldstaff, and prioritized for spring and winter 2008:

- 1) Old oxbows and riverine scrub associated with the Dano Khola, and Gaidahawa Taal (Rupendehi). The 1:25,000 Lumbini sheet shows a band of open terai NE of the Lumbini Development Area interspersed with old oxbows of the Dano Khola. No vegetation type is given. Patches of scrub (and grassland?) are frequently depicted on meanders of the Dano. Gaidahawa Taal is a successful community-managed wetland and local refuge for waterfowl (Hanlon and Giri 2007).
- 2) The middle Marthi Khola (Kapilvastu). A section of this large stream N of Belbhariyaghat and the Golaha wetland looks good for riverine scrub and/or woodland. A large (c. 70 ha) patch S of Mardagad (Nandanagar VDC) is labeled as scrub on the Lumbini sheet.
- 3) Lower Banganga grassland patches and scrub (Kapilvastu). Grassland patches along meanders of the Banganga E and N of Hardauna Ghat, to E of Taulihawa. This section may contain substantial patches of grassland and scrub. The Banganga Nadi may be an important migratory pathway for birds and deserves further assessment.
- 4) The Kachaniya Khola (Kapilvastu). A 20 km long perennial stream in W-C Kapilvastu. Only a 1.5 km section has been reconnoitered. The Chanauta and Bhalubari topo sheets do not depict vegetation type. Local people in the Dharamnagar area said much of the stream course to the S and SE is marshy and bordered by patches of cultivation, scrub and grass.
- 5) Jagdishpur Reservoir (Kapilvastu). Labelled as Sagar Taal on the Gorusinghe topo sheet. A reservoir and distinct IBA 8 km N of Taulihawa, fed by the Banganga River. The current status of this important mixed wetland is uncertain and the bird fauna poorly known. Jagdishpur is in an advancing eutrophic and siltation stage (Baral and Inskipp 2004), and in the recent past has often been drained of water by early winter (Cox 2002, H. S. Baral, pers. comm.). BCN is conducting surveys of Jagdishpur and the proximate smaller wetlands of Sagarhawa and Niglihawa to better document bird fauna and assess conservation needs (H. S. Baral, pers. comm.).



- 6) Forests in the upper Biso Khola, Churia Range base (Kapilvastu). Topo sheets and local information suggest that mixed forests in the Biso watershed W of the Chirai Khola (Gugauli VDC) are less disturbed by human activities than the upper Chirai at the base of the Churia. The area is more remote from habitation and near the Nepal-India border in NW Kapilvastu. The isolated settlement of Kalyankot to the N in the Churias/far upper Chirai merits inclusion in surveys.
- 7) Forests of the upper Chisopani Khola, inner Churia Range (Dang Deukhuri). Based on perusal of the Satbariya topo sheet, and a distant view in May 2007 from Simmuwa Danda in the the Masot Khola, mixed forests in the less steep upper Chisopani Khola are denser and more evergreen than in the Masot watershed.
- 8) Broadleaf forest patch SW of Arjunkholagau (Dang Deukhuri). A fenced patch of mixed broadleaf forest under military protection. Good understorey at E perimeter and some tall *sal* and other trees. Local people said the tallest/oldest trees are routinely cut.

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Last but certainly not least, many other local people met in Rupendehi, Kapilvastu and Dang Deukhuri facilitated and invigorated the surveys with their knowledge, stories and hospitality.



Fig. 59. Indian Peafowl façade, Tulsipur, Kapilvastu.

### Literature Cited:

- Baral, H. S. and C. Inskipp. 2004. The state of Nepal's birds 2004. Department of National Parks and Wildlife Conservation, Bird Conservation Nepal and IUCN-Nepal. Kathmandu.
- Baral, H. S. and C. Inskipp. 2005. Important Bird Areas of Nepal: key sites for conservation. BCN and BirdLife International, Kathmandu and Cambridge.
- Baral, H. S. and D. B. Chaudhary. 2006. Status and distribution of Slender-billed Babbler *Turdoides longirostris* in Chitwan National Park. *Danphe* 15(4): 1-6.
- Cox, J. 2002. Return to Kapilvastu. *Danphe* 11(2): 4-7.
- Cox, J. 2006. Khadara Phantha: a highly endangered and large patch of relict grassland in the west-central terai, Nepal. Unpublished synopsis.
- Cox, J. (in prep). A Record of Slender-billed Babbler *Turdoides longirostris* from the west-central terai, Kapilvastu district. *Danphe*. Bird Conservation Nepal.
- Cox, J. and D. Giri. 2007. Khadara Phantha: an Endangered Relict Grassland in the West-central Terai. *Danphe* 16(1): 26-28.
- Grimmett, R., C. Inskipp and T. Inskipp. 1998. Birds of the Indian Subcontinent. Oxford University Press, Delhi.
- Grimmett, R., C. Inskipp and T. Inskipp. 2000. Birds of Nepal. Prakash Book Depot, New Delhi.
- Hanlon, D. and D. Giri. 2007. Exploring the farmlands of Lumbini IBA. *Danphe* 16(1): 71-72.
- Mallalieu, M. 2007. Lumbini in January: Eagles in the Mist. *Danphe* 16(1): 49-50.
- Suwal, R. N. 2002. Standing tall with Sarus Cranes. *Danphe* 11(1): 15-16.

## Appendix 1. Participatory Rural Appraisal (PRA) rationale and techniques.

The following summary draws extensively on the work of Chambers (1983, 1992) and Grant (1996), and is extracted from Cox *et al.* (2006).

- **They teach us.** In a reversal of roles, outsiders learn from and with rural people; elicit and use their criteria; discover understanding and appreciate indigenous technical knowledge. Outsiders listen and learn instead of lecturing. Interactions are scheduled for times that are convenient for the community or informants, and happen at a relaxed and informal pace. Note taking is kept to a minimum. Questionnaires are usually avoided. Open-ended questions are asked. Information is probed for, and cross-checked to verify accuracy and reliability.
- **We facilitate.** Local people are empowered and enabled to lead PRA exercises (e. g. mapping, ranking, scoring, planning), and are encouraged to analyze and interpret the results. They own the results and share them with outsiders. *Locally-determined* assistance, whether advisory or material, is the desired output.
- **Critical self-awareness about our attitudes and behavior.** How to deal with doubt; learn by doing; embrace and learn from error. (We often learn more from our mistakes than successes). Build learning and improvement into each activity. Seek diversity and difference. Make rapport more important than methodology; empathy; humor; respect; trust; encouragement; confidence that they can succeed.
- **Outside investigator's direct contact.** Staying in the village. Engaging in face to face contacts. Asking to be taught. Working in small groups. Finding the right questions to ask (We assume we know what to ask; the beginning of wisdom is to realize how often we do not know, and to recognize that we need their help [Chambers, 1992]). Direct observation. Identifying key informants. Seeking a variety of contributors in meetings. Involving women at each and every stage.
- **The power of the open against the closed, the visual against the verbal; group versus individual analysis, and comparing versus measuring.** We are trained to make absolute measurements, although trends, scores or ranking are often all that is required (Chambers 1992). PRA methods are qualitative rather than quantitative.

### Literature cited:

Chambers, R. 1983. Rural Development. Putting the last first. Longman Group UK Ltd. Hong Kong.

Chambers, R. 1992. Relaxed and participatory rural appraisal notes on practical approaches and methods. Notes for participants in the workshop held in Chiang



Mai on November 19-20, 1992. Social Research Institute. Chiang Mai University, Thailand.

Cox, J., B Gowep, A. Mava, J. Wana, J.-M. Genolagani, V. Kula, G. Solmu, R. Sine, D. Wilken, and E. Langelet. The saltwater crocodile *Crocodylus porosus* egg harvest program in Papua New Guinea: linking conservation, commerce and community development. Pp. \_\_\_-\_\_\_ in Proceedings of the 18<sup>th</sup> Working Meeting of the IUCN/SSC Crocodile Specialist Group. Montélimar, France. \_\_\_-\_\_\_ June 2006. IUCN, Gland.

Grant, N. 1996. Community entry for ICAD projects -- the participatory way. PNG Biodiversity Conservation and Resource Management Programme. Department of Environment and Conservation, UNDP. Port Moresby.

