

**Assessing Conservation Threat in an Endemic Bird Area:
The Great Slaty Woodpecker in Sub-Himalayan Uttarakhand,
India**

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INTRODUCTION

1.1 Background and global perspective

Woodpeckers belong to a faunal group (Family Picidae) that is highly sensitive to changes in woody vegetation attributable to anthropogenic causes, including those related to forest management and exploitation. Operations like logging, systematic manipulation for forest structure, plantations and fuelwood extraction are therefore likely to have an impact on the extant woodpecker community (Mikusiński, 2006).

It has been noted that larger woodpeckers are affected by conventional forestry operations to a much greater degree than smaller ones. Large-bodied woodpeckers generally require larger trees for nesting, roosting and foraging, and such trees are usually the first to be harvested in typical silvicultural practices (Short and Horne, 1990). They also require larger areas of forest for foraging.

Decline of old-growth forests are believed to be the main causative factors for the probable extinction of two of the world's largest woodpecker species – the Imperial Woodpecker (*Campephilus imperialis*) and the Ivory-billed Woodpecker (*Campephilus principalis*) in the Americas (Short and Horne, 1990).

The Great Slaty Woodpecker (*Mulleripicus pulverulentus*) is the largest in Asia and is perhaps the largest surviving Picid in the world. Although this species distributed widely (extending from Greater Sundas, through Indochina, Myanmar, Northeast India and Nepal, till northwest India), it is scarce throughout its distribution. The Great Slaty inhabits mature dipterocarp forests wherever it exists in the world (Winkler et al., 1995). The species breeds cooperatively (Lammertink, 2004) and occurs in groups of up to 12 individuals (pers. obs.).

Like the Imperial and the Ivory-billed, the Great Slaty too has experienced a decline due to logging of primary dipterocarp forests. According to a recent study, the global population of this species has reduced by as much as 90% during the last 100 years, primarily due to habitat lost to logging (Lammertink et al., 2009). Taking note of this finding, the IUCN has elevated the criticality status of Great Slaty Woodpecker to 'Vulnerable' in 2010 (BirdLife International, 2010).

1.2 The Great Slaty Woodpecker in India

So far, there are only anecdotal and unpublished accounts of the Great Slaty from the Indian subcontinent. In India, the Great Slaty Woodpecker is believed to occur in a narrow, discontinuous belt of the sub-Himalayan moist deciduous forests (Ali and Ripley, 1983), mostly consisting of sal (*Shorea robusta*), extending from Uttarakhand in the west to Arunachal Pradesh in the east, up to 1000 m asl. The species is rare throughout its range. However, it may be seen fairly often at places where it occurs, e.g. in Dudhwa National Park in Uttar Pradesh (D. Mohan, pers comm.), Corbett Tiger Reserve and Ramnagar Forest Division in Uttarakhand (pers. obs.). Occasional sightings of the species have been reported from Arunachal Pradesh (P. Singh, pers. comm.; R. Naniwadekar and S. Prasad, pers. comm.). However, hardly any quantitative information is available on its population status or its habitat preferences in India.

1.3 Great Slaty Woodpecker in the Sub-Himalayan Uttarakhand region

The sub-Himalayan Uttarakhand state forms a significant part of the distribution of the Great Slaty because this region forms the northernmost as well as westernmost extent of its distribution. This region is covered by moist deciduous forests dominated by sal (Champion and Seth, 1968). Because of the economic importance of sal timber, these forests have been intensively managed for nearly a century. As a result of this, the original structure and composition of sal forests have both been significantly altered. This area is an important repository for biodiversity as it harbours many species of conservation importance, including tiger and Asian elephant, and forms the part of the Terai Arc Landscape (Johnsingh *et al.*, 2004). The region is also a vital area for bird diversity that includes 17 species of woodpecker.

Our earlier work in the eastern part of sub-Himalayan Uttarakhand (Ramnagar Forest Division and Corbett Tiger Reserve) indicates that the Great Slaty is extremely rare in the region, seen only occasionally in native sal or managed sal with mature trees (Kumar *et al.*, 2011). Kolhu Chaur in Lansdowne forest division was believed to be the westernmost breeding distribution for the species (Ali and Ripley, 1883). Although a few stray (unpublished) sightings of the Great Slaty have been reported from the area west of Kolhu

Chaur i.e. Rajaji National Park (A. Harihar, pers. comm.) and Dehradun Forest Division (pers. obs.), most of these observations were made during winter when the species is believed to range wider than during the nesting season.

1.4 Rationale and objectives of the current project

The present project was conceived in order to understand the population status and habitat relationships of this rare woodpecker species. Such knowledge can help in setting up monitoring protocols in conservation programmes, prioritisation of some areas for strict protection in the future and advising forest management policy, particularly in the state of Uttarakhand. The information generated through field surveys can be used to predict the occurrence of GSW in the rest of its range in the Himalayas. This study is expected to add research-based information to the WWF's Terai Arc Landscape conservation project as well.

The main objectives of this project were:

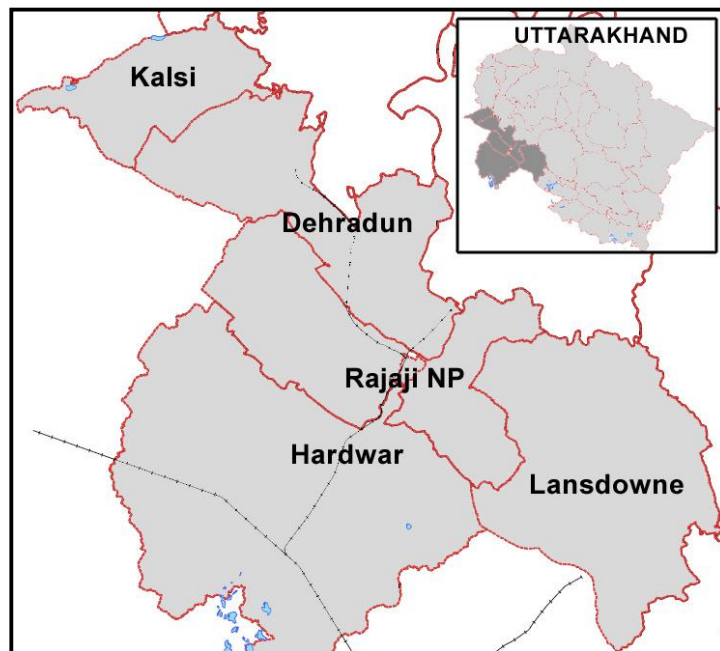
1. To survey the distribution of Great Slaty Woodpecker in the sal forests of western Uttarakhand;
2. To search for and record breeding sites;
3. To quantitatively relate its occurrence to specific habitat features; and
4. To identify threats to its population in lower Uttarakhand

2. METHODS

2.1 Identification of potential sites

Our previous study on woodpecker communities (Kumar *et al* 2011) as well as published literature from south-east Asia had suggested that the Great Slaty Woodpecker was likely to be partial to forests having mature sal trees. We consulted records of the Forest Department, i.e. management plans and compartment histories, to identify 50 forest blocks (locations) having older sal trees in the forest divisions of Lansdowne, Hardwar, Dehradun, Kalsi and Rajaji National Park (see Figure 1), which could potentially support the Great Slaty.

Figure 1: Major units of forest administration (Forest Divisions) and their location in Uttarakhand



2.2 Playback surveys for Great Slaty Woodpecker

We used playback survey method to assess presence of the Great Slaty Woodpecker. Woodpeckers, including Great Slaty, elicit a good response to conspecific call playbacks in the form of conspicuous visual or aural cues and are hence detected (Kumar and Singh, 2010).

At each location we selected multiple points to carry out surveys for woodpeckers. Depending on the configuration and terrain we selected up to 7 points at each location but in most cases we had 4–5 points per location. At each point we broadcast the calls of the Great Slaty Woodpecker 4 times in succession (once in each cardinal direction), interspersed with 10 sec observation interval. The minimum distance between successive points was 400 m to prevent any overlap between the coverage areas of the corresponding broadcast stations.

Figure 2: Call playback broadcast survey for Great Slaty Woodpecker



2.3 Assessment of habitat features

In conjunction with playback surveys, we also collected data on habitat. At each broadcast point, we enumerated four trees using the point-centred quadrat (PCQ) method. These data were used to calculate tree basal area for each location. Additionally, we also qualitatively assessed the forest age, composition and slope.

3. RESULTS

3.1 Survey effort, geographical coverage

Playback surveys were conducted between May and August 2011. We surveyed 50 locations spread over the administrative units of Lansdowne and Dehradun Forest Divisions, and Rajaji National Park (Table 1; Figure 3). The surveyed area consisted of a belt of sal forest approximately 100 km long and 35 km wide oriented in a NW–SE direction. In all, 213 broadcast stations were used to conduct playback (Table 1).

3.2 Sightings of the Great Slaty Woodpecker

We sighted the Great Slaty Woodpecker at 7 locations out of the 50 surveyed (Table 1; Figure 3). The mean group size was 3 and ranged from 1 to 5 individuals.

Table 1: Particulars of locations surveyed, Great Slaty Woodpecker detections, and cavity trees

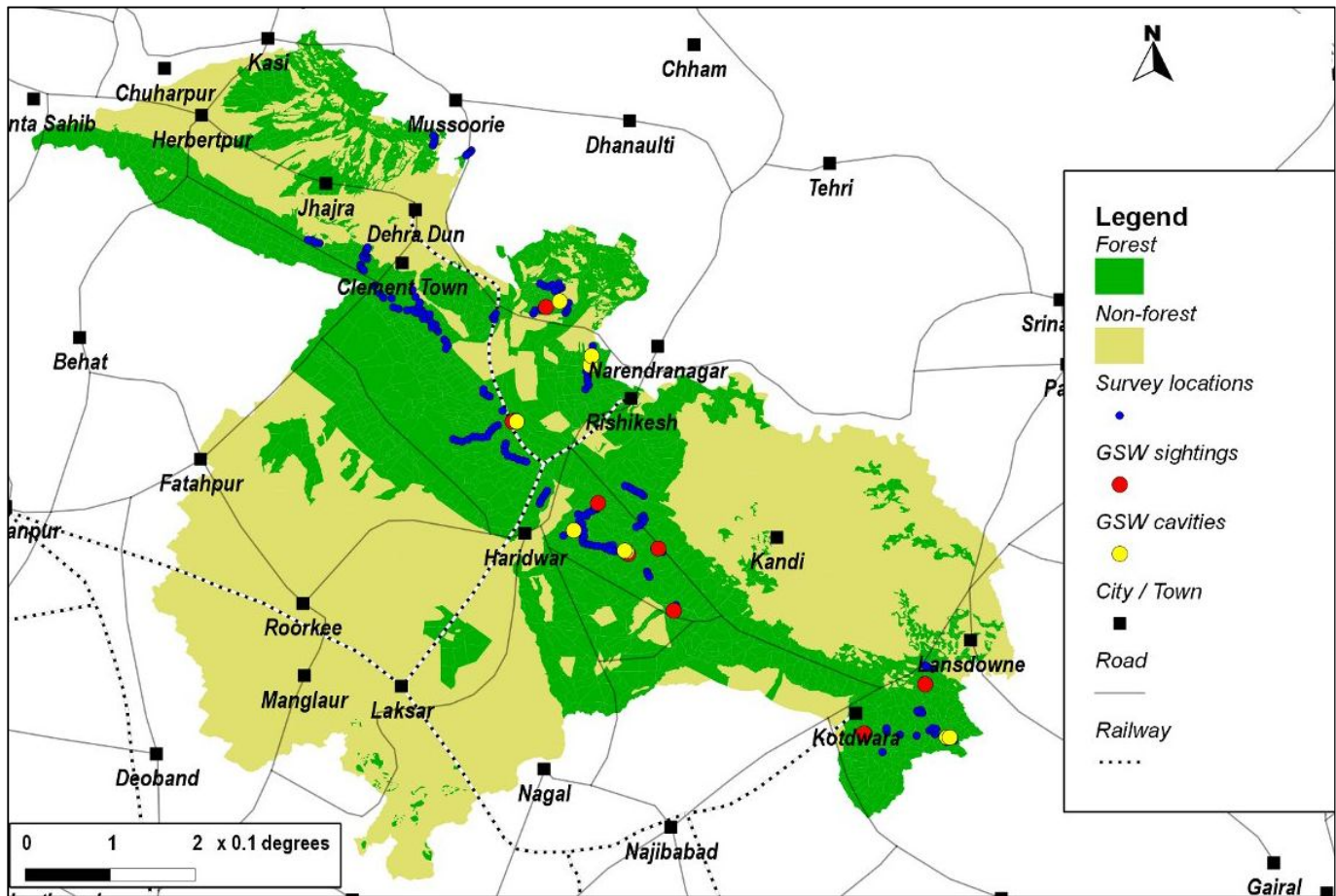
Forest division	Location	No. of playback stations	No. of GSW detections	No. of individuals	No. of GSW cavity trees
Dehradun	Asarori 1	4	-	-	-
Dehradun	Asarori 2	6	-	-	-
Dehradun	Barkot 1	6	-	-	2
Dehradun	Barkot 2	5	-	-	-
Dehradun	Chandrabani 1	5	-	-	-
Dehradun	Chandrabani 2	4	-	-	-
Dehradun	Chandrabani WII	4	-	-	-
Dehradun	Galjwari	4	-	-	-
Dehradun	Karwapani	4	-	-	-
Dehradun	Lachiwala	5	-	-	-
Dehradun	Rajpur	4	-	-	-
Dehradun	Thano 1	4	-	-	-
Dehradun	Thano 2	6	-	-	-
Dehradun	Thano Ramnagar 1	5	-	-	-
Dehradun	Thano Ramnagar 2	6	-	-	1
Lansdowne	Chaukham	5	2	5, 4	2
Lansdowne	Dhimki Hill	5	-	-	-
Lansdowne	Dhimki-Nauri 1	4	-	-	-
Lansdowne	Dhimki-Nauri 2	4	1	1	-
Lansdowne	Murakhal	4	-	-	-
Lansdowne	North Kotdi 1	2	1	5	-
Lansdowne	South Kotdi 1	2	-	-	-
Lansdowne	South Kotdi 2	1	-	-	-

Lansdowne	South Kotdi 3	1	-	-	-
Rajaji NP	Ber Sot	5	-	-	-
Rajaji NP	Bulindawala 1	4	-	-	-
Rajaji NP	Bulindawala 2	5	-	-	-
Rajaji NP	Chilla	4	-	-	-
Rajaji NP	Ghasiram 1	7	-	-	-
Rajaji NP	Ghata 1	3	-	-	-
Rajaji NP	Ghata 2	4	-	-	-
Rajaji NP	Hazara	4	1	3	1
Rajaji NP	Jhabrawala	5	-	-	-
Rajaji NP	Jogi Chaur	4	-	-	-
Rajaji NP	Kansrao 1	5	1	3	1
Rajaji NP	Kansrao 2	5	-	-	-
Rajaji NP	Kauriya	7	-	-	-
Rajaji NP	Kharkhari	5	-	-	-
Rajaji NP	Koelpura 1	4	-	-	-
Rajaji NP	Koelpura 2	4	-	-	-
Rajaji NP	Mithawali	4	-	-	1
Rajaji NP	Mundal	6	-	-	-
Rajaji NP	Phandowala 1	4	-	-	-
Rajaji NP	Phandowala 2	3	-	-	-
Rajaji NP	Ramgarh	3	-	-	-
Rajaji NP	Rawasan	4	-	-	-
Rajaji NP	Sain Sot 1	3	1	3	3
Rajaji NP	Sain Sot 2	3	-	-	-
Rajaji NP	Sarkada	3	-	-	-
Rajaji NP	Soni Sot	5	1	2	-
TOTAL		213	7	7	8

3.3 Cavities of the Great Slaty Woodpecker

At four of the locations where we had Great Slaty sightings, we also encountered trees with cavities of the species (Table 1; Figure 3). Cavity trees were found at four other locations too; however, the woodpecker itself was not sighted at these locations. At some places where we found cavity trees, we found other cavity trees in the same proximity, suggesting site fidelity for nesting.

Figure 3: Location of survey blocks, Great Slaty Woodpecker sightings and cavity trees in the study area



Almost all cavity trees had multiple cavities arranged in a vertical formation (Figure 4). The number of cavities ranged from a single cavity to up to 9 in a single tree (Table 2). The mean DBH (diameter at breast height) of cavity trees was 55.3, suggesting that only mature trees were suitable for constructing cavities. While almost all the cavity trees were in live trees, it was observed that many of them were deformed or infested (Table 2).

3.4 Great Slaty Woodpecker detection in relation to habitat characteristics

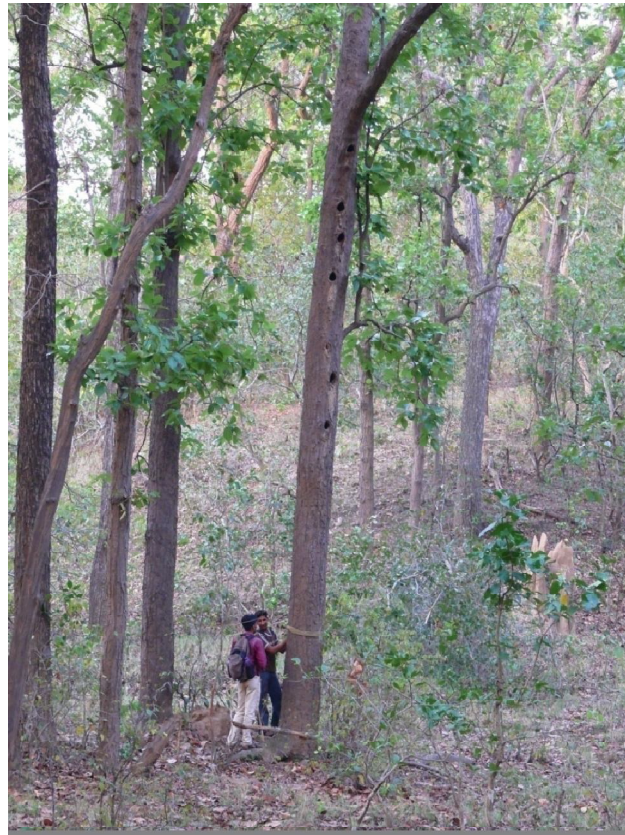
Due to the low number of detections, it was not possible to carry out modelling relating occurrence to habitat features. However, we computed descriptive statistics for Great Slaty detections vis-a-vis habitat. Areas where Great Slaty Woodpeckers were detected had a

mean basal area of 33 m²/ha (Figure 5a). This was not significantly different from the value of locations where the woodpecker was not detected.

Table 2: Details of Great Slaty Woodpecker cavity trees

Location	Tree species	Tree condition	DBH	No. of cavities
Chaukham	Sal	Live, broken top	57	3
Chaukham	Sal	Live, broken top	50	4
Hazara	Sal	Live	47	2
Sain sot	Sal	Live, bent	35	6
Sain sot	Sal	Live, termite infested	46	8
Sain sot	Sal	Live	47	8
Kansrao	Sal	Live	67	1
Thano	Sain	Live, slanting	63	9
Barkot	Sain	Live, broken top	61	1
Barkot	Sain	Live	79	1
Mean (±SD)			55.3 (±12.7)	4.3 (±3.2)

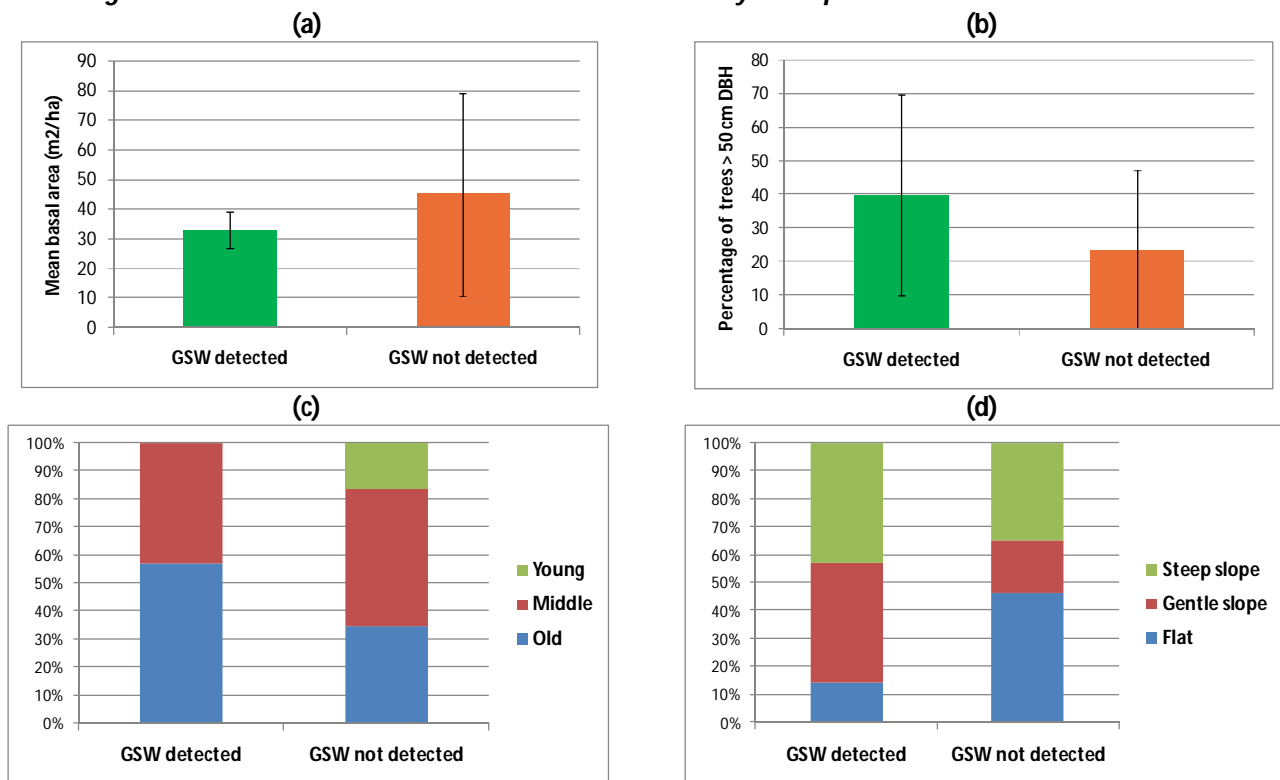
Figure 4: Multiple cavities of Great Slaty Woodpecker in a single tree



Notably, the locations where the woodpecker was observed had a higher proportion of large sal trees, i.e. those with DBH > 50 cm (Figure 5b). Most of the Great Slaty detections were in old sal stands and the remaining were in middle-aged sal stands. Locations with young sal had no detections of the species, suggesting that young stands are not suited for Great Slaty (Figure 5c).

Areas that had Great Slaty detections were mostly on steeply or gently sloping ground (Figure 5d). There were no apparent differences in the distribution of sightings as per composition of forest, however, it may be noted that the woodpecker was not observed in mixed forests.

Figure 5: Habitat characteristics at sites where Great Slaty Woodpecker was and was not detected



3.5 Behavioural observations on the Great Slaty Woodpecker

We took detailed observations on two cavity sites used by the Great Slaty Woodpecker. At the first site, which was located in Kotdi Range, Lansdowne Forest Division, we observed that the woodpeckers emerged from their roost/nest cavities a few minutes before dawn

and perched on an emergent bare branch of another tree near the cavity tree. This was accompanied by a lot of vocal communication and contact calling. Thereafter, the group dispersed to their foraging grounds in the surrounding sal forests. At dusk, the group congregated on one or two trees near the cavity tree (Figure 6). This event was accompanied by a lot of vocalisation. Then, one by one the woodpeckers entered their respective cavities, taking up to 5 minutes to first inspect the cavity before entering it. It was noticed that at this time the woodpeckers were extremely cautious and immediately flew away at the slightest disturbance.

Figure 6: Great Slaty Woodpeckers congregating at dusk before entering cavities



At the other cavity tree location in Kansrao Range, Rajaji National Park, we observed a group of three Great Slaty Woodpeckers. A breeding pair was engaged in what was most likely to be incubation (Figure 7). Both the male and the female participated in these duties in turn. An incubation session lasted 8–48 minutes at the end of which the individual that was outside came to the mouth of the cavity and signalled to its incubating mate, who emerged from the cavity. Immediately after the emergence, the other individual entered the cavity to assume duty. We observed one more individual, likely to be a helper, in the proximity of the cavity but it apparently did not participate in incubation duties.

Figure 7: Great Slaty Woodpecker at nest cavity



4. LESSONS FROM THIS STUDY

4.1 Status of Great Slaty Woodpecker in western sub-Himalayas

We found that the Great Slaty is extremely rare in the area we had surveyed. However, in most places where the species was detected, we had multiple sightings of the species, which suggests that the species has a fair degree of site fidelity. Further, in some cases, the species was sighted in locations from where they have been reported earlier by naturalists.

4.2 Breeding range distribution

The present study found credible evidence of breeding of the Great Slaty nearly 100 km westward of the previously known limit i.e. Kolhu Chaur. Observations at Kansrao in Rajaji National Park confirm that the species is breeding in the Doon Valley.

4.3 Habitat of the Great Slaty

Although we did not have adequate data to obtain conclusive insights on the habitat preferences of the species, the present study offers insight about potentially important factors that may influence the Great Slaty, particularly its breeding. Large trees, snags and contiguous sal forest seem to be vital for this species.

4.4 Conservation implications

Our observations on the cavities of the Great Slaty are a significant addition to the current knowledge about this species. The fact that deformed and infested trees, above a size of 55 cm gbh are suitable sites for cavity excavation underscores the importance of large, 'imperfect' trees as a resource for the breeding requirements of this species. Selective logging, silvicultural operations such as thinning, removal of deadwood and pruning, and conversion of sal forest to plantations of exotic species, could further endanger this rare species. Finally, our observations on breeding-related activities of the species shed light on the behavioural aspects of this little-known and vulnerable species. We recommend that the remaining old-growth stands of sal forest be conserved without silvicultural working in order to conserve this species. It is also necessary to consolidate the existing old-growth forest occurring along the Himalayan foothills by restoring contiguity at the landscape level, possibly through reworking of management plans and initiating restoration activities in the lower Himalayas. This is a real possibility since timber extraction has come to a halt and large parts of the area are being prioritised for wildlife conservation.

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REFERENCES

- Ali, S., Ripley, S.D., 1983. Handbook of the birds of India and Pakistan: together with those of Bangladesh, Nepal, Bhutan and Sri Lanka, Compact Edition edn. Oxford University Press, Delhi.
- BirdLife International, 2010. Species factsheet: *Mulleripicus pulverulentus*. <<http://www.birdlife.org>> (accessed 30-10-2011).
- Champion, H.G., Seth, S.K., 1968. A revised survey of the forest types of India. Government of India, Delhi.
- Johnsingh, A.J.T., Ramesh, K., Qureshi, Q., David, A., Goyal, S.P., Rawat, G.S., Rajapandian, K. and Prasad, S., 2004. Conservation status of tiger and associated species in the Terai Arc Landscape, India. RR-04/001, Wildlife Institute of India, Dehradun.
- Kumar, R. and Singh, P. 2010. Determining woodpecker diversity in the sub-Himalayan forests of northern India using call playbacks. *Journal of Field Ornithology* 81: 215–222.
- Kumar, R., Shahabuddin, G. & Kumar, A. 2011. How good are managed forests at conserving native woodpecker communities? A study in sub-Himalayan dipterocarp forests of northwest India. *Biological Conservation* 144: 1876-1884.
- Lammertink, M., 2004. Grouping and cooperative breeding in the Great Slaty Woodpecker. *Condor* 106, 309–319.

- Lammertink, M., Prawiradilaga, D.M., Setiorini, U., Naing, T.Z., Duckworth, J.W., Menken, S.B.J., 2009. Global population decline of the Great Slaty Woodpecker (*Mulleripicus pulverulentus*). *Biological Conservation* 142: 166-179.
- Mikusiński, G., 2006. Woodpeckers: distribution, conservation, and research in a global perspective. *Annales Zoologici Fennici* 43: 86-95.
- Short, L.L., Horne, J.F.M., 1990. Woodpeckers: a world perspective and conservation concerns. In: *Conservation and Management of Woodpecker Populations*. eds A. Carlson, G. Aulen. Department of Wildlife Ecology, Swedish University of Agricultural Sciences, Uppsala.
- Winkler, H., Christie, D.A., Nurney, D., 1995. *Woodpeckers: An identification guide to the woodpeckers of the world*, First edn. Houghton Mifflin Company, New York.

Appendix: Details of locations surveyed, Great Slaty Woodpecker detections, and habitat characteristics

Forest division	Location	No. of playback stations	No. of GSW detections	No. of individuals	No. of GSW cavity trees	Basal area (m ² /ha)	% of large trees (>50 cm DBH)	Forest composition	Terrain	Forest age
Dehradun	Asarori 1	4	-	-	-	24.59843	0	Sal	Flat	Young
Dehradun	Asarori 2	6	-	-	-	39.18937	0	Sal	Steep slope	Young
Dehradun	Barkot 1	6	-	-	2	64.14575	8	Sal	Flat	Middle
Dehradun	Barkot 2	5	-	-	-	221.2236	18	Sal	Flat	Old
Rajaji NP	Ber Sot	5	-	-	-	21.9195	43	Sal	Gentle slope	Old
Rajaji NP	Bulindawala 1	4	-	-	-	35.69446	33	Sal	Flat	Old
Rajaji NP	Bulindawala 2	5	-	-	-	27.39118	11	Sal	Flat	Middle
Dehradun	Chandrabani 1	5	-	-	-	40.64307	17	Sal	Flat	Middle
Dehradun	Chandrabani 2	4	-	-	-	82.84267	8	Sal	Flat	Middle
Dehradun	Chandrabani WII	4	-	-	-	42.55182	33	Sal	Flat	Middle
Lansdowne	Chaukham	5	2	5, 4	2	27.06452	11	Sal	Gentle slope	Old
Rajaji NP	Chilla	4	-	-	-	21.83749	31	Sal-mixed	Flat	Middle
Lansdowne	Dhimki Hill	5	-	-	-	30.63089	43	Sal	Steep slope	Middle
Lansdowne	Dhimki-Nauri 1	4	-	-	-	50.53592	13	Sal	Steep slope	Young
Lansdowne	Dhimki-Nauri 2	4	1	1	-	30.66549	31	Sal	Steep slope	Middle
Dehradun	Galjwari	4	-	-	-	38.58331	0	Sal	Steep slope	Young
Rajaji NP	Ghasiram 1	7	-	-	-	13.50288	12	Sal	Steep slope	Middle
Rajaji NP	Ghata 1	3	-	-	-	44.31851	50	Sal-mixed	Steep slope	Middle
Rajaji NP	Ghata 2	4	-	-	-	108.5777	31	Sal-mixed	Gentle slope	Old
Rajaji NP	Hazara	4	1	3	1	33.74214	14	Sal	Gentle slope	Old
Rajaji NP	Jhabrawala	5	-	-	-	26.72757	25	Sal	Flat	Middle
Rajaji NP	Jogi Chaur	4	-	-	-	16.63842	6	Sal	Flat	Middle
Rajaji NP	Kansrao 1	5	1	3	1	44.86714	100	Sal	Flat	Old

Rajaji NP	Kansrao 2	5	-	-	-	55.30442	11	Sal-mixed	Gentle slope	Old
Dehradun	Karwapani	4	-	-	-	49.02894	7	Sal	Flat	Middle
Rajaji NP	Kauriya	7	-	-	-	46.38589	94	Sal	Gentle slope	Old
Rajaji NP	Kharkhari	5	-	-	-	42.14117	82	Sal	Flat	Old
Rajaji NP	Koelpura 1	4	-	-	-	29.82612	7	Sal	Gentle slope	Young
Rajaji NP	Koelpura 2	4	-	-	-	32.63538	14	Sal	Steep slope	Middle
Dehradun	Lachiwala	5	-	-	-	56.40048	11	Sal	Flat	Old
Rajaji NP	Mithawali	4	-	-	1	22.22968	7	Sal-mixed	Steep slope	Old
Rajaji NP	Mundal	6	-	-	-	44.05231	16	Mixed	Steep slope	Middle
Lansdowne	Murakhal	4	-	-	-	81.46465	7	Sal	Steep slope	Middle
Lansdowne	North Kotdi 1	2	1	5	-	26.96094	33	Sal	Steep slope	Middle
Rajaji NP	Phandowala 1	4	-	-	-	72.64951	14	Sal	Flat	Middle
Rajaji NP	Phandowala 2	3	-	-	-	28.05242	20	Sal	Flat	Middle
Dehradun	Rajpur	4	-	-	-	49.25449	0	Sal	Steep slope	Young
Rajaji NP	Ramgarh	3	-	-	-	40.91502	0	Sal	Steep slope	Young
Rajaji NP	Rawasan	4	-	-	-	12.10431	5	Mixed	Steep slope	Old
Rajaji NP	Sain Sot 1	3	1	3	3	32.20826	50	Sal	Gentle slope	Old
Rajaji NP	Sain Sot 2	3	-	-	-	31.98026	71	Sal	Gentle slope	Middle
Rajaji NP	Sarkada	3	-	-	-	10.59571	18	Mixed	Gentle slope	Old
Rajaji NP	Soni Sot	5	1	2	-	36.25213	40	Sal-mixed	Steep slope	Middle
Lansdowne	South Kotdi 1	2	-	-	-	35.52887	11	Sal	Gentle slope	Old
Lansdowne	South Kotdi 2	1	-	-	-	11.58686	8	Sal-mixed	Steep slope	Middle
Lansdowne	South Kotdi 3	1	-	-	-	32.92794	33	Sal	Steep slope	Middle
Dehradun	Thano 1	4	-	-	-	51.40986	25	Sal	Flat	Old
Dehradun	Thano 2	6	-	-	-	51.56232	11	Sal	Flat	Middle
Dehradun	Thano Ramnagar 1	5	-	-	-	54.97198	82	Sal	Flat	Old
Dehradun	Thano Ramnagar 2	6	-	-	1	46.17852	64	Sal	Flat	Old