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*The Condor* 97:271–273
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# NEW INFORMATION ON KITTLITZ'S MURRELET NESTS[1]

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*Key words: Alaska;* Brachyramphus brevirostris; *Kittlitz's Murrelet; nest-site characteristics; Russia.*

Kittlitz's Murrelets (*Brachyramphus brevirostris*) are alcids that nest solitarily in remote areas of Alaska and the Russian Far East (AOU 1983, Day et al. 1983). Because of their low nesting density, the extreme difficulty of finding their nests, and the fact that areas used for nesting (talus slopes) are of such little interest to ornithologists that they rarely are surveyed, only 17 nests of this species have ever been located (Day et al. 1983). Although the sample size was small, the analysis presented by Day et al. (1983) suggested that this species was adapted to nesting in rocky, poorly vegetated scree slopes that occur at high elevations in the southern part of their range and at low elevations in the northern part of their range. Since that paper was published, only three new nests of this species have been found. This paper reports on the nesting habitat and nest-site characteristics of these new nests and compares them with those discussed previously; each nest is named for the mountain on which it was found.

The Mt. Griggs nest (~58°21′N, 155°08′W) was found in Katmai National Park, Alaska, on 2 July 1979 (Table 1; P. Shearer photo, on file at the University of Alaska Museum [UAM]). In the photo, a Kittlitz's Murrelet chick sitting in a nest was similar in size and plumage characteristics to a six-day-old chick that had been photographed (E. P. Bailey, photo) in the Frosty Peak nest (see Day et al. 1983 for names of nests). The nest was 39 km from Katmai Bay (the nearest salt water that would be available to adults for feeding) and 5.6 km from Knife Creek, which is a roiling, dangerous river in the Valley of the Ten Thousand Smokes. The nest was situated at the base of a moderately sized (~0.3 m diameter) rock. From the photograph, this site does not appear to be sheltered from the weather but does appear to be well sheltered from debris rolling downhill.

The Broken Mountain nest (58°17′N, 155°10′W) was found in Katmai National Park, Alaska, on 23 July 1986 (Table 1; T.E.C. Keith, photo, on file at UAM). The chick in this nest appears to be the same age or a little older (i.e., ~6–10 days old) than the Bailey bird

[1] Received 12 April 1994. Accepted 23 August 1994.

TABLE 1. Nesting habitat and nest-site characteristics of new Kittlitz's Murrelet nests.

| Characteristic | Nest name | | |
|---|---|---|---|
| | Mt. Griggs | Broken Mountain | Tavuvnan Mountain |
| Elevation (m) | ~2,000 | 975 | <1,000 |
| Aspect | SW | SSE | southerly |
| Slope (°) | ~30 | ~20 | — |
| Distance to nearest coastline (km) | 39 | 32 | ~5 |
| Distance to nearest stream (m) | 5,600 | 2,400 | ≤2,500 |
| Vegetative cover (%) | 0 | 0 | 0 |
| Nest at base of rock? | yes | yes | yes? |
| Vertical distance below top of mountain (m) | ~340 | ~180 | — |
| Other comments | exposed site | sheltered site | small depression |

at 6 days of age but does not look as well developed as that bird at 13 days of age (E. P. Bailey, photo). The nest was 32 km from Katmai Bay and 2.4 km from Knife Creek, although a trip to the river would require travel over the top of Broken Mountain. The nest was situated in a small depression at the base of a moderately sized (~0.5 m diameter) rock that clearly is the largest in the photograph, which encompasses a fairly large area of hillside. This site appears to be sheltered both from the weather and from debris rolling downhill.

The Tavuvnan Mountain nest (~59°45'N, ~164°27'E) was found in the northeastern part of the Kamchatka Peninsula, Russia, on 26 June 1990 (Smetanin 1992). (NOTE: The published latitude of this nest [54°45'N] apparently was incorrect.) The nest was located ~5 km from the nearest salt water on an unvegetated, south facing scree slope consisting of large, crushed rocks (Table 1). The nest was a depression 30 cm in diameter by 4 cm in depth and apparently had a thin layer of lichens in the cavity. The egg measured 55 m by 30 mm and was pale green with dark brown spots over the entire shell. On a map of Kamchatka, this area consists of a narrow band of low-lying coastal plain, with the area inland from there consisting of mountains that extend up to 800–1,200 m in elevation. The maximal distance of this nest from the Kichiga River would be 2,500 m. Although no rock uphill from the nest is mentioned explicitly in the paper, the presence of the nest on a scree slope (i.e., an area of "large, crushed rocks") and in a depression (i.e., a "hole in the ground") leads me to believe that the nest was a small depression at the base of a rock on which Smetanin sat. The Frosty Peak (Bailey 1973), Humphrey Creek (Fox and Hall 1982), Atka Island (Day et al. 1983), and Broken Mountain (above) nests all consisted of small nest depressions downhill from or between large rocks.

The main features of these new Kittlitz's Murrelet nests are similar to those described by Day et al. (1983). First and most importantly, all three of these nests, which occurred in the southern part of the nesting range, were located at moderate-high elevations on unvegetated scree slopes. In addition, at least two of the three nests were located on the downhill side of large rocks, and the Tavuvnan Mountain nest probably was also. Slopes of the Mt. Griggs and Broken Mountain nests also were similar to those reported for earlier nests, and the maximal vertical distance below the top of a mountain was extended only slightly (to ~340 m) by the Mt. Griggs nest.

Although most of the main features are similar to those described previously, some differ. First, the Mt. Griggs nest is now the highest-elevation nest known of this species and is nearly twice as high as the previously highest nest. Second, in contrast to data presented in Day et al. (1983), aspects of these three new nests were southerly, rather than northerly (see below). Finally, the likelihood that fledged juveniles from the Mt. Griggs and Broken Mountain nests would be unable to survive a ride in the nearby raging streams suggests that at least some (if not most) of these inland juveniles must fledge from nests that occur at sometimes great distances from the coast, rather than using nearby streams to swim to sea (*contra* Day et al. 1983:272).

Most significantly, addition of these new nests to the existing data set results in a new pattern of nesting aspect: two nests have faced east, one has faced west, four have faced in a northerly direction (i.e., >270° but <90°), and five have faced in a southerly direction (i.e., >90° but <270°). This emerging pattern may be related to elevation, in that three of the four highest-elevation nests have faced in a southerly direction and the fourth has faced east (see Table 1 and Day et al. 1983). These results suggest that birds nesting at high elevations (and probably high latitudes) may do so primarily at the bases of southerly facing rocks, where the snow would tend to melt off earliest because of solar warming. Indeed, the Pavlof Volcano (Thayer 1914), Shelikhova Bay (Kishchinskii 1965), Frosty Peak (Bailey 1973), and Harris Bay (Day et al. 1983) nests all were located in bare spots in snow fields or near glaciers, and a miner who was acquainted with the nesting habits of this bird in the Pavlof Volcano area claimed that Kittlitz's Murrelets lay eggs in bare spots amid the snow (Thayer 1914). Thus, it appears that at least some birds may nest on southerly facing slopes because the nest sites become available early at high elevations.

T.E.C. Keith of the U.S. Geological Survey, Alaska Volcano Observatory, Anchorage, AK, generously provided the photographs and information on the Mt. Griggs and Broken Mountain nests. S. Lecomte of the Dept. of Foreign Languages, University of Alaska–Fairbanks, translated the Smetanin paper for me. F. H. Fay of the Institute of Marine Sciences, University of Alaska–Fairbanks, provided additional informa-

tion. This manuscript has been improved greatly by the comments of D. D. Gibson, J.-P. Savard, and an anonymous reviewer. This manuscript is dedicated to the memory of my late friend F. H. Fay.

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*The Condor* 97:273–275
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# NEST-SITE CHARACTERISTICS OF THE MADAGASCAR BUZZARD IN THE RAIN FOREST OF THE MASOALA PENINSULA[1]

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*Key words: Madagascar Buzzard;* Buteo brachypterus; *nest-site selection; habitat; rain forest; Madagascar.*

Raptor breeding density may be limited in part by the availability of suitable nest sites (Newton 1979). Numerous studies in North America have sought to quantitatively describe raptor nesting habitat (Titus and Mosher 1981, Andrew and Mosher 1982, Bednarz and Dinsmore 1982, Moore and Henny 1983). The need for studies of raptor nesting habitat is particularly important in tropical regions such as Madagascar, that are experiencing rapid habitat loss.

The Madagascar Buzzard (*Buteo brachypterus*), one of eight species of diurnal raptors endemic to Madagascar, is reported to be common in wooded habitats (Langrand and Meyburg 1984). The habitat requirements of the Madagascar Buzzard, however, have not been investigated. The goal of this study was to describe the nests, nest trees, and nesting habitat of the Madagascar Buzzard in the rain forest of the Masoala Peninsula.

## STUDY AREA AND METHODS

The study was conducted during December 1991 and from November 1992 to January 1993 near the Andranobe Field Station at the mouth of Andranobe Creek about 8 km south of the village of Ambanizana on the west coast of the Masoala Peninsula in Madagascar (15°41'S; 49°57'E). The west coast of the peninsula is sparsely inhabited by people in widely scattered villages. Along the coast and major rivers, the landscape is a mosaic of slash-and-burn clearings, secondary growth, and primary forest. The interior of the peninsula, except along the Ambanizana River, is undisturbed rain forest. The entire peninsula is roadless; however trails were cut to reach nest sites.

The lowland rain forest of the Masoala Peninsula has a canopy height $\leq$30 m with few emergent trees, high floristic diversity, and steep mountainous topography (Guillaumet 1984). Elevations on the Masoala Peninsula range from 0 to 1,200 m. Average annual rainfall for the area is not yet available; however 6,501 mm of rain was recorded at the field station in 1992. Monsoon rains and cyclones occur between December and April, whereas rain falls steadily between May and August (Donque 1972). September through November are normally the driest months. Temperatures vary between 18° and 31°C throughout the year.

I located ten nests by imitating the buzzard's call, a "piercing, plaintive mew" (Langrand 1990), and walking in the direction of responding calls. I located two nests by climbing emergent trees to look out over the canopy. I found one nest by offering a reward to local people for reports of nesting activity. I found nine nests in 1991 and four new nests in 1992. Three (33%) of the nests found in 1991 were reused in 1992. Since I did not mark the birds, I do not know if any buzzard pairs I observed in 1991 relocated to new nests in 1992.

[1] Received 4 May 1994. Accepted 13 October 1994.
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