

## A SURVEY OF PERUVIAN TORRENT DUCKS (*MERGANETTA ARMATA LEUCOGENIS*) ON TWO RIVERS IN PERU

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**Reconocimiento del Pato Correntino Peruano (*Merganetta armata leucogenis*) en dos ríos del Perú.**

**Key words:** *Merganetta armata leucogenis*, Peru, Peruvian Torrent Duck, survey.

### INTRODUCTION

The Torrent Duck (*Merganetta armata*) occupies a large geographic range in the Andean highlands of South America, extending from Venezuela down to southern Chile (Callaghan 1998). One of only four species of anatid river specialists that exhibit year-round territoriality and long term pair bonds (Eldridge 1986), the Torrent Duck is ecologically limited to torrential mountain streams at elevations generally greater than 1500 m (Johnsgard 1966).

Torrent Ducks in the subspecies *Merganetta armata leucogenis* are found throughout Peru, Bolivia and Ecuador and are considered vulnerable by the Threatened Waterfowl Specialist Group (in prep.). Due to the birds' scattered distribution and secretive manner, systematic population surveys are lacking and the Torrent Duck remains one of the least known species in the family Anatidae. Baseline information about population density and distribution is vital for successful detection of changes in population over time, and

thus for directing conservation management of the species.

We conducted surveys for Peruvian Torrent Ducks on portions of two rivers in two major drainage systems in northern and southern Peru. Our objectives were to (1) locate river stretches that are used by Peruvian Torrent Ducks as potential sites for future study; and (2) establish new baseline numbers for monitoring population trends in the future.

### STUDY AREA

There are three major drainage systems in Peru. To the west of the Andes, rivers drain to the Pacific Ocean, to the east of the Andes they drain to the Amazon river (which drains to the Atlantic Ocean), and rivers in the southern part of the Andes drain to Lake Titicaca. We chose to survey rivers in two of these drainage systems by their ease of access, suitability for Torrent Ducks, and proximity to areas that have been previously surveyed.

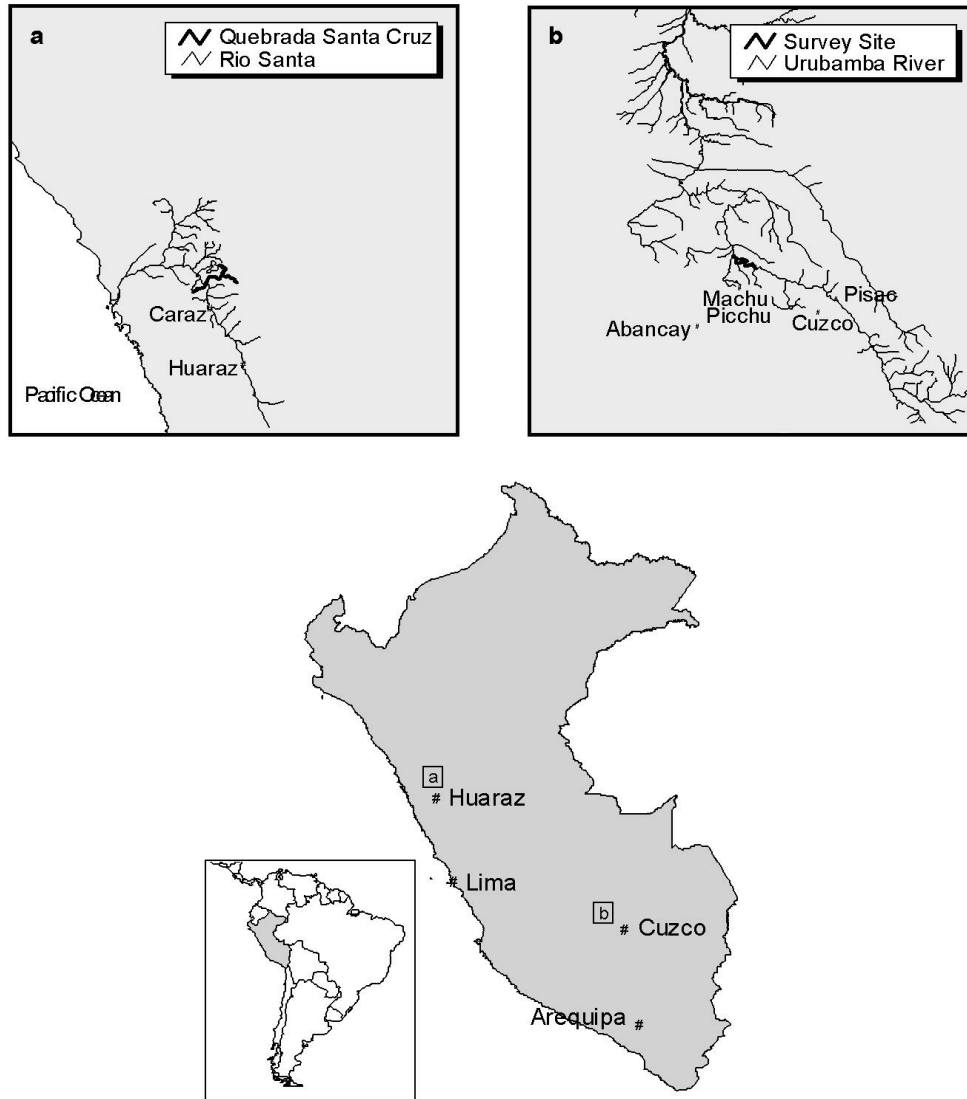


FIG. 1. Map of Peru showing locations of Peruvian Torrent Duck surveys on the (a) Quebrada Santa Cruz, and (b) Urubamba River.

*Quebrada Santa Cruz.* This river is a tributary of the Río Santa that originates high in the Cordillera Blanca in northern Peru and drains into the Río Santa about 70 km downstream from Huaraz, and eventually into the Pacific Ocean (Fig. 1a). We surveyed a portion of the

river that runs through the Parque Nacional Huascarán (Huascarán National Park) that was protected from many forms of human disturbance such as dams and hydroelectric plants, although livestock grazing was common. The portion of the river we surveyed

ranged in elevation from 4200 m to 3200 m. Although it is protected in a National Park, large portions of this river are subjected to livestock grazing, and the first ten km of the river surveyed (4200 m to 3800 m) were barren of streamside vegetation due to grazing by horses, cows, and burros. In addition, much of the river flowed at low gradients and may not have been swift enough to support an ample food supply for the birds.

*The Urubamba River.* This river is located in southwestern Peru and is a tributary of the Amazon River (Fig. 1b). The Urubamba begins high in the southern Peruvian Andes and flows northwest past Cuzco, through the Sacred Valley, winds around Machu Picchu, and finally joins the Tambo River to drain into the Ucayali, and eventually the Amazon River. The Urubamba is subject to human disturbance in the form of agricultural runoff and hydroelectric dams. There was an hydroelectric dam on the 7-km stretch of river that we surveyed. We conducted our survey out of Aguas Calientes, a small town located at approximately 2000 m elevation at the base of Machu Picchu, just northwest of Cuzco. In this area, the Urubamba is fast flowing, contains numerous large boulders within and along the edge of the river, and is approximately 20 m wide. Streamside vegetation is dense, consisting of large trees and shrubs.

## METHODS

We conducted surveys from May 3–13, 2001 by walking along the edge of the rivers at water level whenever possible. The birds were quite tolerant of our presence and would generally act normally if we moved slowly along the river bank. When the banks became too steep, we surveyed the river with binoculars from above.

We surveyed a total of seven km of the

Urubamba River over a period of three days; three km downstream of Aguas Calientes and four km upstream. On the Quebrada Santa Cruz, we surveyed approximately thirteen km over a three day period. This river became quite difficult to survey as the banks became steep and major landslides had destroyed the original trail that closely followed the river.

## RESULTS

*Quebrada Santa Cruz.* We found no sign of Torrent Ducks in the first ten km of the river, even where the instream habitat seemed suitable (e.g., fast flowing water, ample riffles). In the final three km that we were able to survey, the banks became steeper thus deterring livestock, and the streamside vegetation was thick. However, the only ducks we observed were two males who were jointly defending a very large territory that was at least one km in length. The males behaved like a mated pair, feeding together and perching on the same boulder. They flew approximately one km downstream together when we disturbed them and were observed at their new location feeding and loafing together. No females were sighted on this river.

*Urubamba River.* On our first day, we found two pairs of Torrent Ducks on the 3-km stretch of river from Aguas Calientes to Puente Ruines. We observed the birds perching on large boulders and feeding by diving into the eddies formed downstream of rocks. The birds did not appear wary, and allowed us to observe them if we stayed very still and quiet. On the following two days, we observed two pairs of ducks in the same general areas as before, and one female duck at about the 3-km mark upstream. Although we observed her for 30 min, we saw no sign of a male. However, it is unlikely that an unpaired female would defend a territory by herself, so we assumed that this was

another pair and the male evaded detection. In the 4-km stretch upstream from Aguas Calientes, we observed four pairs of Torrent Ducks. One pair had an older (Class B) duckling – all three were perched on a large boulder together. This was the only duckling that we saw during our survey. Another pair was located approximately 300 m from a hydroelectric dam/plant.

## DISCUSSION

Torrent Ducks are ecologically limited to torrential mountain streams characterized by fast flowing cold water moving over a substratum of rock, stones and gravel (Johnsgard 1966). The birds feed primarily on insect larvae, especially caddis-flies, that are most abundant in shallow riffles (Hynes 1970). Torrent Ducks have been reported in elevations ranging from 200 m to 4500 m, although 1500 m is typically the low end of their distribution. Therefore, the streams we chose to survey met the basic criteria for supporting Torrent Ducks.

Although we are unaware of a previous survey on the same stretch of the Urubamba River, a tributary of the Urubamba River was surveyed for Torrent Ducks in July 1965 in the same general area (Johnsgard 1966). The river supported a good population of Torrent Ducks and the survey results suggested a maximum population of about one pair per kilometer over a 19-km stretch of river. Our survey revealed a similar pair density with six pairs and one lone female observed over a 7-km stretch of river. In addition, we observed one older duckling with one of the pairs, suggesting that at least some of the birds are reproducing successfully. Our survey was conducted at the beginning of the dry season, so it is possible that the major breeding season had not yet begun. Chapman (1921) reported a pair with two downy young in late July in a stream near the Urubamba, so the

breeding season may be an extended one in this population.

This stretch of the Urubamba appeared quite pristine with healthy streamside vegetation and only one small village (Aguas Calientes) located on the river. Access to Aguas Calientes is by train only, and the road from Aguas Calientes to Machu Picchu runs along the river for only 2.5 km before veering up the mountainside. Thus there is little human access to the area and the river at this point may be quite healthy. This assertion is perhaps supported by the fact that Peruvian Torrent Duck pair densities were similar in 1965 and 2001. There is a new hydroelectric dam located about 4 km upriver from Aguas Calientes, but this has not seemed to affect the ability of Torrent Ducks to use this portion of the river. Indeed, we observed high pair densities in the 7-km stretch of river immediately downstream from the dam, indicating that the river is still suitable for habitation by these birds.

To our knowledge, Quebrada Santa Cruz has not been surveyed previously. However, Torrent Ducks have been observed on the Quebrada Yanganuco, another tributary of the Río Santa that drains the Cordillera Blanca southeast of the Quebrada Santa Cruz, although the numbers seen were not recorded (Johnsgard 1966). Because it is protected in a national park, we assumed this river would be in pristine condition and able to support a healthy population of Torrent Ducks. Although much of the river we surveyed seemed suitable for Torrent Ducks, there were a number of places where the stream gradient was likely too low to support the ducks. In addition, the overgrazed stream banks may have deterred the birds as there was little cover and few suitable nest sites would likely be available. The two males we observed were in a stretch of river with a high gradient and dense streamside vegetation, but these were the only ducks

we observed. It is possible that there were more ducks further downstream where we were unable to conduct an adequate inventory in the precipitous and thickly vegetated canyon.

Our results suggest that distribution of the Peruvian Torrent duck may be patchy, even in habitats that appear to be suitable. Thus establishing a systematic population survey protocol may be quite challenging. Further research is needed to better quantify the characteristics of streams that are used by Torrent Ducks to help direct successful survey efforts. Furthermore, results of previous surveys and our own suggest that the Urubamba valley may be an area of high Torrent Duck concentration. Therefore, scientists may want to focus future research on this understudied species in watersheds located within the Urubamba drainage system.

#### ACKNOWLEDGMENTS

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