CONSERVATION STATUS OF THE TORRENT DUCKS *MERGANETTA*

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In total, seven separate Torrent Duck taxa have been described, although a tentative classification followed in this paper includes only a single species Merganetta armata and three subspecies (M. a. armata, M. a. leucogenis and M. a. colombiana.) Distribution limits of these taxa are inadequately known, although preliminary delimitations are provided. Population estimates and trends are provided for each subspecies, and an assessment against the new IUCN Red List Categories shows that two qualify as globally threatened, while the nominate subspecies and the species as a whole qualify as Low Risk (least concern). Priority actions for the conservation of this group include a revision of the systematics, production of "key catchment" inventories and the production and implementation of catchment management plans.

Keywords: Torrent Duck, Conservation Status

The Torrent Ducks *Merganetta* are an aberrant group of birds scattered throughout most of the Andes, from Venezuela to Tierra del Fuego. They inhabit boulder-strewn rivers and streams, where they feed principally on aquatic invertebrates. Breeding pairs are resident and strongly territorial, defending a length of river usually measuring 1-2 km. Birds are encountered most frequently between 1,000 and 4,000 m above sea level, although in the southern parts of their range they frequently occur at lower altitudes (Johnsgard 1966, Moffett 1970, Johnsgard 1978, Eldridge 1986).

Owing to the relatively low population densities and continued habitat degradation in parts of their range, some concern has arisen about the conservation of the various taxa within this group (see Callaghan & Green 1993). However, evaluations of conservation priorities have been hampered by uncertainty, particularly with regard to the systematics of the genus, distribution and population levels. The aim of this paper is to review these aspects of Torrent Duck conservation and to propose priorities for future action.

Systematics

In total, seven separate Torrent Duck taxa have been described: *Merganetta armata* Gould 1841, *Merganetta leucogenis* (Tschudi 1843), *Merganetta colombiana* Des Murs 1845, *Merganetta turneri* Sclater and Salvin 1869, *Merganetta garleppi* Berlepsch 1894, *Merganetta fraenata* Salvadori 1895 and *Merganetta berlepschi* Hartert 1909. Following these descriptions, Conover (1943) concluded that *fraenata* was synonymous with *armata*, while Johnsgard (1966) suggested that *turneri, garleppi* and *berlepschi* should be considered synonymous with *leucogenis*, and that *Merganetta* comprises a single species, *Merganetta armata* Gould 1842, and three subspecies, *M. a. colombiana* Des Murs 1845, the highly polymorphic *M. a. leucogenis* (Tschudi 1843), and *M. a. armata* Gould 1842. These suggestions are followed tentatively hereafter, and systematic details of each taxon are provided, including the most important diagnostic features (after Phillips 1926, Wetmore 1926, Conover 1943, Neithammer 1952, Delacour 1956, Johnsgard 1966, 1978, and Weller 1968).

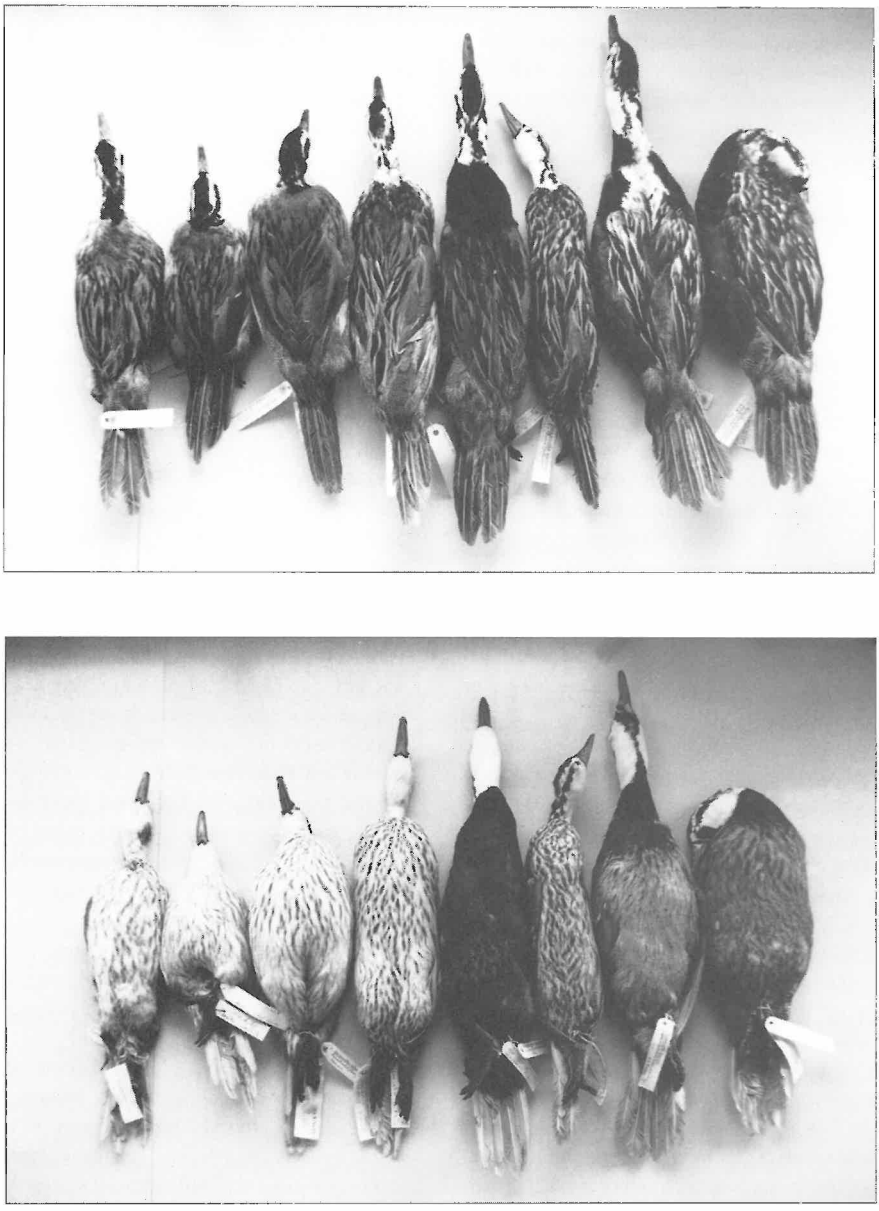

Figure 1. Dorsal and ventral views of male Torrent Ducks (from left to right): *M. a. colombiana* (collected from Merida Province, Venezuela), *M. a. colombiana* (collected from Bogotá, Colombia), *M. a. colombiana* (collected from Papallacta Lake, Ecuador), *M. a. leucogenis* (collected from Huancavelica, Peru), *M. a. leucogenis*, formerly *turneri* (collected from Rio Victor, Peru), *M. a. leucogenis*, formerly *garlepii* (collected from Rio Blanco, Bolivia), *M. a. armata* (collected from Lake Nahuel, Argentina) and *M. a. armata* (collected from 'eight miles south of Lago Fagnano', Tierra del Fuego).

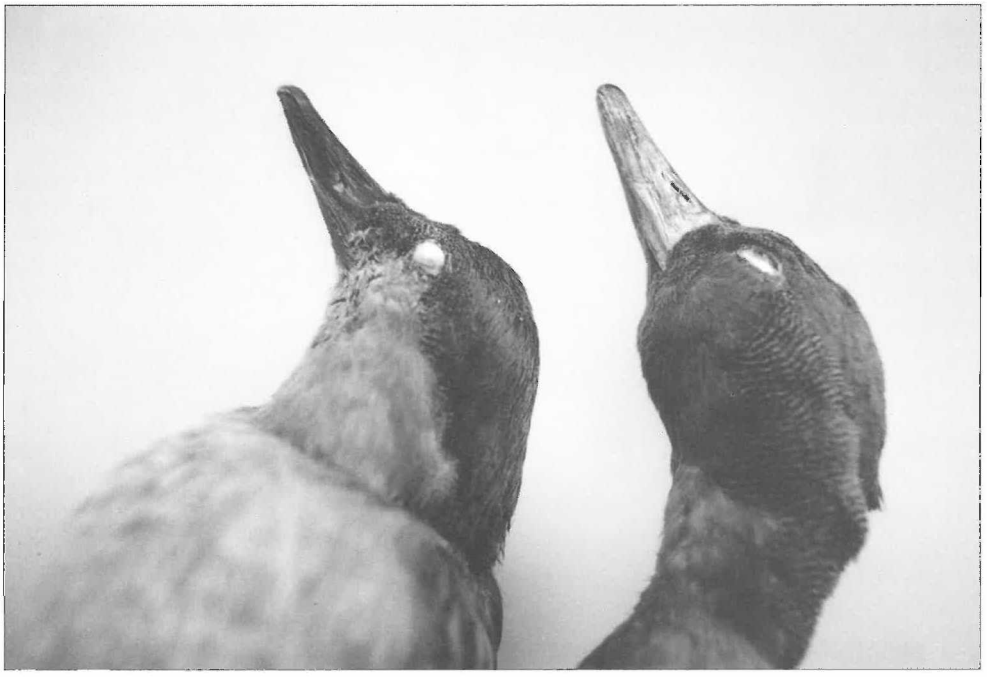

Figure 2. Head portraits of female Torrent Ducks: above, *M. a. armata* (collected from Rio Claro, Chile) and below, *M. a. colombiana* (collected from Papallacta Lake, Ecuador).

Merganetta a. armata Gould 1841. *Proc. Zool. Soc. London.*, 9, p. 95. **Type locality:** Colchagua, 34°-35°S, Chile. **Diagnostic features:** Adult males - differ from *leucogenis* and *colombiana* by having a black, vertical band running from the eye, sometimes from the crown, to the chin and down the fore-neck, where it is sometimes partially obsolete, to the black chest (**Figure 1**). Adult females - same as *leucogenis*, but differ from *colombiana* by having a deep ferruginous chest, and the posterior part of the cheeks and the sides of the neck are grey and finely barred with white (**Figure 2**). Immatures - same as *leucogenis*, but differ from *colombiana* by having the posterior part of the cheeks and the sides of the neck marked heavily with grey.

Merganetta a. leucogenis (Tschudi 1843). *Arch. Naturg.*, 9, (1), p. 390. **Type locality:** Mana Rimacunan, sources of the Aynamayo, Junín, Peru. **Diagnostic features:** Adult males - extremely variable, but differ from *armata* by lacking a vertical facial band and from *colombiana* by having a darker breast (**Figure 1**). Adult females - same as *armata*. Immatures - same as *armata*.

Merganetta a. colombiana Des Murs 1845. *Rev. Zool.*, p. 179. **Type locality**: not given, but Colombia by inference. **Diagnostic features:** Adult males - differ from *armata* by lacking a vertical facial band and from pale-breasted *leucogenis* by having even paler breasts, since the dark shafts of the breast feathers are narrower and lighter (**Figure 1**). Adult females - differ from *armata* and *leucogenis* by having paler, more ochraceous, chest and under parts, and almost lacking the grey colouring and white vermiculations on the cheeks and sides of the neck (**Figure 2**). Immatures - differ from *armata* and *leucogenis* by having the posterior part of the cheeks and the sides of the neck white (occasionally with slight dusky speckling) and not marked heavily with grey.

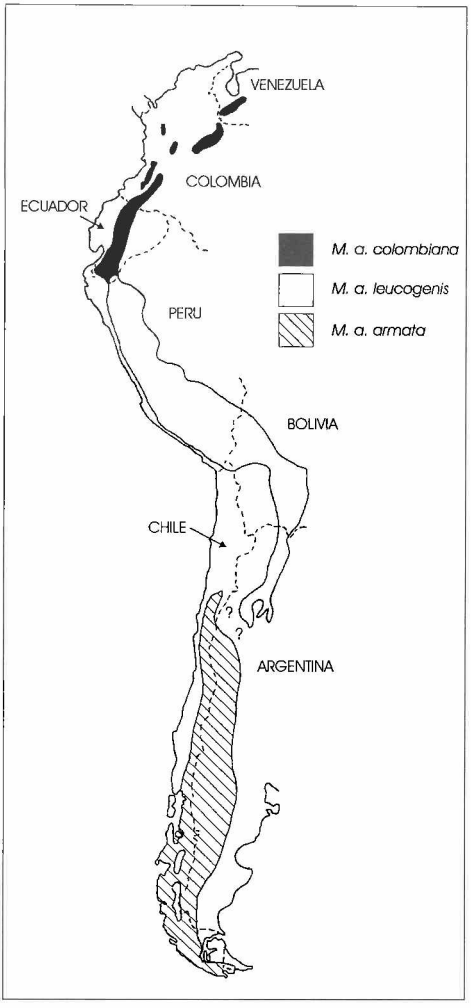

Figure 3. Distribution of the Torrent Ducks (after Phillips 1926, Wetmore 1926, Conover 1943, Goodall *et al.* 1951, Neithammer 1952, Phillips 1953, Delacour 1956, Phelps & Phelps 1958, Johnson 1963, 1965, Johnsgard 1966, 1978, Humphrey *et al.* 1970, Meyer de Schauensee 1971, Meyer de Schauensee & Phelps 1978, Koepcke 1983, Hilty & Brown 1986, Araya & Millie 1988, Gómez-Dallmeier & Cringan 1989, Narosky & Yzurieta 1989, Fjeldså & Krabbe 1990, Canevari *et al.* 1991, T. Narosky in litt. 1992, E. Ramilo *in litt.* 1992, T. Clare *in litt.* 1995).

Distribution

The distributional limits of the three subspecies of Torrent Duck remain unclear (**Figure 3**). For example, the population may be more fragmented in Colombia than in any other country, but this could only reflect the availability of better distributional data for this country (*ie* Hilty & Brown 1986). However it is probable that Torrent Duck populations also are fragmented in other countries. It is notable that it is not possible to depict a break in range between *M. a. colombiana* and *M. a. leucogenis* populations, although *M. a. colombiana* is known to occur south to at least central Ecuador (Conover 1943) and *M. a. leucogenis* is only known definitely from extreme southeast Ecuador (Rio Bombuscara, near Zamora) (T. Clare *in litt.* 1995). Thus, it is tentatively considered that most Torrent Ducks in Ecuador are referable to *M. a. colombiana*, and that *M. a. leucogenis* is limited to small numbers in the southwest. The large break in range in northern Chile between *M. a. leucogenis* and *M. a. armata* corresponds with the desert zone (Johnson 1963), but the break in range between these taxa in Argentina is poorly documented.

Status

Torrent Ducks are threatened particularly by the degradation of rivers, because of mining, sewage, deforestation, agriculture and hydro-electric dams. Over-hunting may be a localized problem, and the introduction of game fish to many rivers poses a potential threat owing to competition for food resources (Humphrey *et al.* 1970, Eldridge 1986, Hilty & Brown 1986, Scott & Carbonell 1986, Madge & Burn 1988, Gómez-Dallmeier & Cringan 1989, E. Tabilo Valdivieso *in litt.* 1992, del Hoyo *et al.* 1992, J. Fjeldså *in litt.* 1993).

M. a. armata is included in the Chilean Red Data Book as 'vulnerable' (Rottmann & Lopez-Calleja 1992), but is well represented in protected areas in both Chile and Argentina (Scott & Carbonell 1986, T. Narosky *in litt.* 1992, E. Ramilo *in litt.* 1992). Within the range of this taxon, human pressures are greatest in

Table 1. Population estimates and trends for Torrent Ducks.

Taxon	Range	Population estimate (individuals)	Population trend	Reference
M. a. colombiana	Venezuela	1,000-2,000	Stable	C.J. Sharpe *in litt.* (1996)
	Colombia	1,000-5,000	Moderate decline	Hilty & Brown (1986); A.J. Negret in litt. (1995)
	Ecuador	5,000	Slow decline	F. Ortiz-Crespo *in litt* (1995)
	TOTAL	**7,000-12,000**	**Slow decline**	
M. a. leucogenis	Ecuador	<100	Stable	T. Clare *in litt.* (1995)
	Peru	5,000	Slow decline	V. Pulido *in litt.* (1995)
	Bolivia	2,000-4,000	Slow decline	L. Jammes *in litt.* (1995)
	N Chile	<100	Stable	S. Navaro *pers. comm.* (1994)
	Argentina	2,000-4,000	Slow decline	L. Marciel *pers. comm.* (1993)
	TOTAL	**9,000-13,000**	**Slow decline**	
M. a. armata	Chile	2,000-5,000	Stable	Callaghan & Green (1992); L. Marciel *pers. comm.* (1993)
	Argentina	2,000-5,000	Stable	M. Christie *in litt.* (1992); L. Marciel *pers. comm.* (1993)
	TOTAL	**4,000-10,000**	**Stable**	
M. armta	**TOTAL**	**20,000-35,000**	**Slow decline**	

central Chile, although large areas of remote habitat remain, particularly in Patagonia. Introduced mink (*Mustela* sp.) pose a potential threat in Aisen Province (Chile) (D. Aldridge verbally, *fide* J. Bowler 1995).

M. a. leucogenis is included in the Peruvian Red Data Book as 'vulnerable' (Pulido 1991) and also will be included as 'vulnerable' in the forthcoming Bolivian Red Data Book (L. Jammes *in litt.* 1995). Peruvian *Merganetta* have undergone large declines in some catchments, for example in the department of Lima (Peru) and La Paz (Bolivia) (Scott & Carbonell 1986, M.A. Plenge *in litt.* 1995). However, large areas of suitable habitat remain, and it seems to be well represented in protected areas throughout most of its range (Scott & Carbonell 1986, T. Narosky *in litt.* 1992, Callaghan & Green 1993, L. Jammes *in litt.* 1995).

M. a. colombiana is included in the Venezuelan Red Data Book as 'endangered' (Rodríguez & Rojas-Suárez 1995). Numbers in Colombia have declined markedly, although healthy populations still exist, for example along the Pacific side of the western mountain range (Hilty & Brown 1986, A.J. Negret *in litt.* 1995). Torrent Ducks are known from Purace National Park in Colombia (Hilty & Brown 1986), and an education programme for this species was initiated in 1988, centred on the rivers of Macizo Colombiano (A.J. Negret *in litt.* 1995). Numbers have also declined in Ecuador, particularly in the Quito basin, although large areas of suitable habitat remain (N. Krabbe *in litt.* 1995, F. Ortiz-Crespo *in litt.* 1995). In Venezuela, most of the population occurs in two large national parks (El Tama and Sierra Nevada) (Scott & Carbonell 1986), and numbers appear to be relatively stable (C.J. Sharpe *in litt.* 1996).

Census data for Torrent Ducks are vitually non-existent, and so estimates of population levels and trends are reduced to informed guesswork. **Table 1** shows such estimates, derived from correspondence with local experts. After using this information to evaluate each taxon against the new IUCN Red List Categories (IUCN 1994), *colombiana* and *leucogenis* qualify as 'vulnerable' (*ie* globally threatened), while the nominate subspecies appears to qualify as 'low risk' (least concern), as does the species as a whole.

Conclusions

A thorough re-analysis of the systematics and population boundaries of the Torrent Duck group is required urgently, based on museum specimens, field surveys, and perhaps employing molecular techniques (*eg* restriction enzyme analysis of mtDNA or species-specific single locus probes). Improved knowledge of the systematics of the *Merganetta* complex is fundamental to conservation efforts, and the group may well contain more than the single species that is recognised currently. A primary result of field surveys should be 'key catchment' inventories, from which the production and implementation of catchment management plans would enhance the conservation status of Torrent Duck populations. Translocation of birds may be a useful future strategy for re-establishing populations in catchments that have been restored (see *eg* Griffith *et al.* 1989). In summary, three main points of action are required:

(i) revision of systematics of the Torrent Duck group, including fine-scale delimitation of included taxa.

(ii) production of 'key catchment' inventories, conducting field work where neccessary.

(iii) production and implementation of catchment management plans in areas that are threatened by development pressures.

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