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## VARIABILITY IN *CHLOEPHAGA PICTA*

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Magellan Shelgeese are the most abundant and widespread of the five species of *Chloephaga*, a peculiar goose-like genus inhabiting the colder parts of South America. Although still present in vast numbers in Patagonia, southern Chile (where they nest as far north as Laguna Las Truchas, Cordillera de Neuble, at 6000 feet in altitude), Tierra del Fuego, Cape Horn Islands, and the Falkland Islands, despite ruthless persecution by sheep farmers, they have been so far insufficiently studied. Their variations, distribution, movements, and life habits still are imperfectly known.

The sexes differ considerably in *Chloephaga picta*. The larger male is predominantly white on the head and neck, whereas the female is ruddy chestnut. The taxonomy of the species has long remained in a state of confusion. It had up to now been thought that all females were alike, although males showed two phases of color, some being pure white on the breast and abdomen, while others are thickly barred with black right across the under parts. Various authors have considered them as two species, others as subspecies, but it was always evident that they were not satisfactorily segregated geographically. White-bellied or barred males occur more or less exclusively in certain parts of the range, while they are mixed to a greater or lesser degree in others; also intermediate specimens exist. Among the latest reviewers, Hellmayr (The birds of Chile, 1932, Chicago, pp. 319-321) recognizes a single species (*picta*), stating, "There can be little doubt in my mind that the two recognized 'species' of Upland Goose, *C. 'magellanica'* and *C. 'inornata'* (or *dispar*), are either merely individual mutants or ill-segregated local races." Conover, however (Birds of the Americas, 1948, Chicago, vol. 1, no. 2, pp. 309-311),

recognizes *dispar* as a subspecies of *picta*, for the barred birds with some misgivings, "From our present knowledge it is impossible to decide whether the so-called Barred Upland Goose is a colour phase, a subspecies, or perhaps even a full species."

In the preparation of a general work on the waterfowls of the world in which I am now engaged, I have had to elucidate the question as well as I could. Fortunately there are large series of *Chloephaga picta* in the American Museum, the majority collected by R. H. Beck between 1912 and 1916, which are very instructive. I also have gathered interesting information from other collectors and observers and from the literature.

The first striking fact that the examination of our series has brought to light is the distinct difference that exists between the populations of the Falkland Islands and those of the mainland of South America, Tierra del Fuego, and neighboring islands. The Falkland birds are considerably larger, as shown by the following measurements for adult birds:

	WING		TARSUS		BILL	
	♂	♀	♂	♀	♂	♀
Falkland Islands	462	418	93	87	43-45	40-41
	450	405	92	75		
	435	417	92	85		
	440	418	95	90		
	437	423	92	84		
		416		82		
		400		85		
		429		86		
Tierra del Fuego and neighboring islands and the Straits of Magellan	400	403	78	78	34-38	33-36
	404	384	72	75		
	408	382	76	77		
	424	384	77	75		
	411	402	80	73		
	397	368	76	78		
	405	390	75	72		
		380		75		
	382		72			
Southern Chile (Punta Arenas, Arcud)	427	370	82	74	35-38	34-35
	439	385	85	77		
	422	372	84	71		
	435		87			
Patagonia (Rio Gal- legos, Urbuhia)	428	378	75	76	35-39	34-36
	438	370	82	73		
	431	387	85	73		
	430	392	83	76		

438	396	86	75
425	394	80	76
405		85	
432		86	
435		88	
		82	
		81	

Such differences in size were pointed out by Oustalet (Mission scientifique au Cap Horn, 1891, Paris, vol. 6, pt. 1, zoologie, p. 191), but apparently no later authors took any notice of his excellent remarks.

All Falkland males are pure white underneath, entirely similar in color to some of the continental and Fuegian birds, but our series show clearly a distinct difference in the color of the females: the Falkland specimens have the black barring of the under parts narrower, the ruddy brown bars being almost twice as broad as the black ones, so that they look lighter and redder than the continental birds in which the black bars are wider than the brown ones. Also the under tail-coverts and the vent are whitish in the Falkland birds, blackish gray in the continental ones. It appears from the scanty material at hand that the chicks differ; those from the Falklands are duller, the pale gray bands over the eyes, on the sides of the back, and on the wings being much smaller, darker, and almost obsolete, while they produce a distinct and showy pattern in South American chicks.

There is a name available for the large Falkland subspecies: *Chloephaga picta leucoptera* (*Anas leucoptera* Gmelin, 1789, *Systema naturae*, vol. 1, pt. 2, 1789, p. 505; Falkland Islands).

The lesser continental and Fuegian Magellan Shelgeese present, however, another problem. While the females are alike throughout the range, if consideration of season, age, and individual variation is duly taken, the males are distinctly dimorphic, plain white or barred across the breast and the belly. The two phases may be found together in almost any locality. The great majority of the birds in Tierra del Fuego are barred, and white-breasted males are rather exceptional, as either isolated specimens or in small groups among the others. Both phases are found in variable proportions along the Strait of Magellan. Farther north in Chile and Patagonia, the males are mostly white breasted; barred and intermediate birds are often scarce, or even absent altogether in certain districts. It appears that there is a tendency to a segre-

gation of the barred form in the south, and of the white-breasted one in the north. But both may occur in many areas.

The degree of barring is variable, some specimens being considerably more heavily marked with black than others. Some are intermediate between the two phases, having white patches on the under parts, or being white with irregular black bars. Barred males have the tail entirely black; white-breasted males have two to four outer pairs of rectrices white. The shade of the gray on the wings also varies and is much darker in barred birds, which also usually retain a buffy wash on the head and neck. The barring of the flanks and mantle varies widely according to individuals in both phases. The question has been further complicated because immature males of the white-breasted phase, and of the Falkland form, show irregular black spotting and lining on the under parts, the full adult plumage being assumed in the third year only.

Because of such instability in characteristics and in distribution, it is difficult to accept subspecific distinctions in those populations. At least until more is learned of these shelgeese, it seems preferable to consider that the name *dispar* (Philippi and Landbeck, 1862, An. Univ. Chile, vol. 21, p. 431), applying to the barred phase, is a synonym of *C. p. picta* Gmelin (1789, Systema naturae, vol. 1, pt. 2, p. 504), a name that has been given to a white-breasted bird after the "Painted Duck" of Latham (1789, A general synopsis of birds, vol. 3, pt. 2, p. 443) from Staten Island.

We therefore recognize two subspecies of Magellan Goose:

1. *Chloephaga picta picta* (Gmelin); southern Chile, Patagonia, Tierra del Fuego, and neighboring islands
2. *Chloephaga picta leucoptera* (Gmelin); Falkland Islands

Examination of large series of *C. rubidiceps* and *C. poliocephala* has failed to reveal any stable variation throughout their range.

The Kelp Shelgoose, *C. hybrida*, however, varies in the same way as *C. picta*. The Falkland Islands population is larger: *C. h. malvinarum* Phillips (1916, Auk, vol. 33, p. 423). Our series does not confirm any constant difference in the color of the crown of the females as has been alleged in the description, but the barring of the breast and flanks is consistently much coarser in Falkland than in South American birds, the white lines being twice as broad. This striking characteristic so far does not appear to have been noticed.