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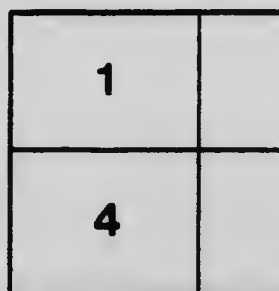
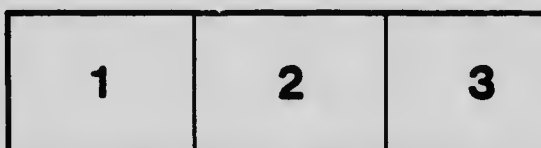
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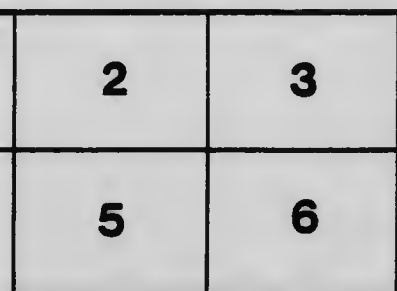
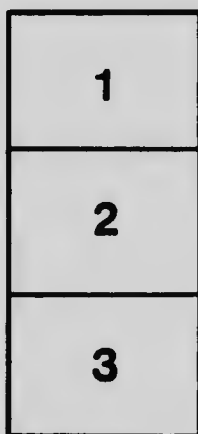
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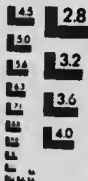
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Geological Survey

Museum Bulletin No. 7

BIOLOGICAL SERIES, No. 4.

DECEMBER 20, 1914

**A NEW SPECIES OF DENDRAGAPUS (DENDRAGAPUS
OBSCURUS FLEMINGI) FROM SOUTHIERN
YUKON TERRITORY**

by

P. A. Taverner

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December 20, 1914

Canada
Geological Survey
Museum Bulletin No. 7.
BIOLOGICAL SERIES, No. 4.

*A New Species of Dendragapus (Dendragapus Obscurus Flemingi),
from Southern Yukon Territory.¹*

BY P. A. TAVERNER.

In the examination of a collection of *Dendragapus obscurus* recently acquired by the Canadian Geological Survey from the Teslin Lake region, on the Yukon-British Columbia boundary, it became evident that a new form of the species was probably represented. Two subspecies have heretofore been recognized as ranging into Canadian territory, *D. o. fuliginosus* and *richardsoni*. *Fuliginosus* is a dark bird with a light tail band and *richardsoni* a lighter one without a terminal band on the tail. The birds under consideration are without the tail band but are even darker than *fuliginosus*.

We had a fair series of both recognized forms from southern British Columbia, all in spring and early summer plumage and hence hard to distinguish with the new form which is represented entirely by late summer and autumn birds. The possibility existed that the darkness of the new birds but represented the new and unaged plumage of the post-nuptial moult; therefore application was made to the U. S. Biological Survey and its chief, Dr. Henshaw, was courteous enough to place at our disposal what summer and autumn specimens there were in the collection of that institution. A comparison of the specimens, including these, confirms our first surmise as to the racial differentiation of the

¹Republished from 'THE AUK,' Vol. XXXI, No. 3, July, 1914, pp. 385-388.

forms and I, therefore, present the following new subspecies for consideration.

Dendragapus obscurus flemingi new subspecies

FLEMING'S GROUSE.

Named after Mr. J. H. Fleming, C.M.Z.S., in recognition of the value of his ornithological work in Canada.

Subspecific Characters. Like *Dendragapus obscurus richardsoni*, without terminal tail band, but darker in general coloration even than *D. o. fuliginosus*.

D. o. richardsoni.¹

Back, interscapulars, and body color of rump. Olive-brown to fuscous.

Tail. Fuscous black. Tail feathers cut off sharply and squarely at end.

Throat patch. Body colour soiled creamy white.²

Sides of head and spotting of throat patch. Fuscous.

Around neck below throat patch. Between buffy brown and olive brown to clove brown, with sometimes a faint bluish tinge, deepening in front at lower neck to fuscous.

Breast and underparts. Light mouse gray.

Description of Type specimen. Type, adult male, No. 6651 Museum of the Geological Survey, Department of Mines, Canada. Near Tealin lake, Yukon Territory, October 10, 1912. Clement Lewis, Collector.

Back, rump, and tail, dusky neutral gray. Central feathers of tail and some lateral ones double rounded at ends.

Upper tail coverts, fuscous black, finely but sparsely vermiculated with buffish slate.³

Scapulars, wings, and upper wing coverts, fuscous, lightening towards wing tip. All, except flight feathers, finely marked with shades between rusty⁴ and grayish.⁵ Some scapulars with white shaft streaks, widening at

¹All colour terms except where otherwise stated, from Ridgway's "Colour Standards and Nomenclature," 1912 ed.

²These terms are not from "Ridgway's Colour Standards."

D. o. flemingi.

Back, interscapulars, and body colour of rump. Dusky neutral gray.

Tail. Dusky neutral gray. Tail feathers not having the same chopped off appearance. Middle and several lateral feathers slightly to markedly double-rounded at end.

Throat patch. Body colour pure white.

Sides of head and spotting of throat patch. Between neutral gray and deep neutral gray.

Around neck below throat patch. Between neutral gray and deep neutral gray, deepening in front at lower neck to dusky neutral gray.

Breast and underparts. Between neutral gray and deep neutral gray.

terminal to poorly defined marginal spots. The latter persisting on some of the lesser coverts as vague spots and narrow borders.

Below, between neutral gray and deep neutral gray, and obscured posteriorly by a white tipping of the feather ends that blends into the white of the basal under tail coverts.

Lower breast feathers with white shaft lines broadening towards the flanks and posteriorly where they develop into broad terminal spots, streaks, and bars. A fine vermiculation of buffy¹ and grayish¹ overlaying the body colour of the feather tips of the sides.

Under tail coverts dusky neutral gray or black with prominent white shaft lines and final borders. White increasing towards base of tail until body colour of feathers is hidden.

Head from deep neutral gray to neutral gray darkest on crown and ear coverts, overwashed with rusty¹ strongest on forehead at base of bill and more or less obscuring body colours of darker feathers and at last dying away at back and sides of upper neck as a faint olivaceous¹ tinge.

Throat patch, white with irregular deep neutral gray spotting, aggregated on malar region and each spotted feather terminated with small white border.

Lores, deep neutral gray, with white flecking.

Dark feathers of the breast band creamy white basally, the white gradually encroaching on the dark tips towards the sides, finally usurping most of the feather and making a semi-concealed white streak down the sides of the neck to the bend of the folded wing.

The characters of the female are less marked than of the male and without series for comparison may be difficult of recognition. However, they average in the same directions as the male being bluer underneath than *richardsoni* and darker dorsally, with the rufous¹ or rusty¹ markings bolder and more decided in character.

Measurements (in inches). Male. average of four specimens.

Wing, 8.25-8.75 (average 8.51); tail, 6.5-6.75 (average 6.33); tarsus, 1.70-1.80 (average 1.75); exposed culmen, 0.65-0.75 (average 0.71).

Female average of twelve specimens.

Wing, 7.45-8.10 (average 7.70); tail, 5.10-5.75 (average 5.25); tarsus 1.48-1.68 (average 1.55); exposed culmen, 0.65-0.71 (average 0.69).

Distribution. This description is based entirely on specimens taken within thirty miles of Teslin lake, on the boundary between British Columbia and Yukon Territory, longitude \dots 30', at the west base of the Cassiar mountains. The range of the form \dots at, therefore, be defined, but a study of the material examined is suggestive.

The male specimens in the series are as follows: British Columbia: Trail, Midway, and Revelstoke: 7 specimens.

Montana and Idaho: Preuss mts., Fiddle creek; and Nyak and Bear-tooth mts.: 4 specimens.

¹These terms are not from Ridgway's "Colour Standards."

Mackenzie; Mackenzie river: 1 specimen.
Yukon Territory, Teslin lake: 4 specimens.

	Wing	Tail	Tarsus	Culmen	General colour
Montana and Idaho	9.06	6.56	1.80	0.80	Light
British Columbia	8.90	6.96	1.77	0.77	Slightly darker
Mackenzie	8.75	6.55	1.70	0.80	Light
Teslin lake, Y. T.	8.51	6.33	1.75	0.71	Dark.

It will be seen that the most southern birds are the largest and lightest; the northern smallest and darkest, while those from lower British Columbia are intermediate though closer to the southern than the northern race. The Mackenzie form, being represented by only a single specimen in not very high plumage, cannot be definitely placed in the series though it agrees closely with the Montana and Idaho specimens. No specimens from the type locality of *richardsoni* (the northeast corner of Rocky Mountain park, lat. 53°, long. 115°) being obtainable I assume from the above that it ranges up the east side of the Rocky mountains and through them south of the International border in unmodified form, while the intermountain birds, *flemingi*, as they distribute northward from the boundary, become smaller and darker. It is possible that on examination, birds from farther north of Teslin lake will exhibit these characters in a still more marked degree

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the first step is to estimate the parameters of the model. This is done by minimizing the sum of squared residuals. The second step is to test the null hypothesis that the model is correctly specified. This is done by using the Lagrange multiplier test.

The Lagrange multiplier test is a statistical test that is used to test the null hypothesis that a set of parameters is equal to zero. It is based on the Lagrange multiplier method, which is a technique for finding the maximum or minimum of a function subject to constraints.

In this case, the Lagrange multiplier test is used to test the null hypothesis that the parameters of the model are equal to zero. The test statistic is calculated as follows:

$$LM = \frac{1}{2} \frac{d^2 L}{d\theta^2} \theta$$

where L is the log-likelihood function, θ is the vector of parameters, and $d^2 L / d\theta^2$ is the Hessian matrix of the log-likelihood function. The test statistic is asymptotically distributed as a chi-squared distribution with k degrees of freedom, where k is the number of parameters being tested.

In this case, $k=1$, since we are testing the null hypothesis that the parameter is equal to zero. The test statistic is calculated as follows:

$$LM = \frac{1}{2} \frac{d^2 L}{d\theta^2} \theta = \frac{1}{2} \frac{d^2 L}{d\theta^2} \theta$$

where L is the log-likelihood function, θ is the parameter, and $d^2 L / d\theta^2$ is the Hessian matrix of the log-likelihood function. The test statistic is asymptotically distributed as a chi-squared distribution with 1 degree of freedom.

The test statistic is calculated as follows:

$$LM = \frac{1}{2} \frac{d^2 L}{d\theta^2} \theta = \frac{1}{2} \frac{d^2 L}{d\theta^2} \theta$$

where L is the log-likelihood function, θ is the parameter, and $d^2 L / d\theta^2$ is the Hessian matrix of the log-likelihood function. The test statistic is asymptotically distributed as a chi-squared distribution with 1 degree of freedom.

