

# IDENTIFICATION AND DISTRIBUTION OF CLARK'S GREBE

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For nearly 100 years ornithologists have considered the genus *Aechmophorus* to include only one species, the Western Grebe (*A. occidentalis*). Few ornithologists, especially amateur field ornithologists, have been aware that the Western Grebe has been considered polymorphic, with two distinct phenotypes referred to as dark and light phases (Storer 1965, Mayr and Short 1970).

Recent study of sympatric dark-phase and light-phase populations indicates the polymorphism classification is erroneous and that the forms function as separate species (Ratti 1979). Additional data are needed on dark-phase and light-phase birds, and hopefully this paper will aid in alerting both professional and amateur ornithologists to the identification and distribution of these species.

## LITERATURE REVIEW

George N. Lawrence (*in Baird 1858:894-895*) originally described the two grebe forms as separate species, calling the dark form the Western Grebe (*Podiceps occidentalis*) and the light form Clark's Grebe (*Podiceps clarkii*). However, Coues (1874) and Henshaw (1881) suggested that the forms were color phases of the same species, and the American Ornithologists' Union (1886, 1931, 1957) classified the forms as a single species. Mayr and Short (1970:88) attributed the variation to "scattered polymorphism."

Both Storer (1965) and Lindvall (1976) reported assortative mating by Western Grebes in Utah — the tendency of birds to mate with individuals of the same phenotype. These reports led me to an intensive study of the two forms beginning in 1975. Observations of breeding pairs in Utah and California revealed that the forms were reproductively isolated, which led to my conclusion that the forms "biologically function as separate species" and to my recommendation for "resurrection of *A. clarkii* as a separate species from *A. occidentalis*, as originally described" (Ratti 1979:582-583). In addition to reproductive isolation, sympatric populations of dark-phase and light-phase birds showed several other differences discussed below. Although no official change in classification has occurred, I will refer to Western and Clark's grebes, as originally proposed by Lawrence (*in Baird 1858*).

## IDENTIFICATION

*Plumage.* Plumage differences between Western and Clark's grebes occur primarily in the facial and flank regions. Careful examination of the black and white facial pattern will allow separation of Western and Clark's grebes in the field. Western Grebes have black crown feathers extending below the eyes, so that the eyes are completely surrounded by black feathers and the lores are black (Figure 1). A small number of Western Grebes with light-colored lores were observed in California in January 1977. No Western Grebes with

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light-colored lores were observed in June of the same year; thus, this variation may be related to winter plumage. Some individuals have a narrow margin of black below the eye. In contrast to the Western Grebe, the black crown of the Clark's Grebe does not extend to the eyes, so that the eyes are completely surrounded by white feathers and the lores are white (Figure 2).

Occasionally intermediate birds were observed. These individuals had the black and white facial margin horizontally bisecting the eye; the upper margin of the eye was in contact with black feathers and the lower margin was in contact with white feathers. The color of the lores varied, but was black in most cases. Intermediate-phase birds are rare; less than 1% of 8,000+ birds observed in California, Nevada, Oregon and Utah were classified as intermediates. Intermediate-phase birds may represent hybrids or phenotypic variants. Field ornithologists are urged to be cautious in their classification of intermediate birds. Clark's Grebes show a much greater margin of white above the eye when the facial feathers are erected during behavioral interactions than when feathers are relaxed. I observed a few Clark's Grebes that appeared to be intermediate birds while relaxed (such as in a sleeping posture), yet distinctly showed a white margin above the eye when facial feathers were erected.

Flank color is another aid in separating Western and Clark's grebes in the field. However, this character is not consistent or as discrete as facial pattern. Western Grebes generally have a uniformly dark back and flank color (Figure 1). In contrast, Clark's Grebes have paler gray backs and flanks that are speckled with white feathers, giving this region a relatively lighter color than that of the Western Grebe (Figure 2). When sunlight is at your back during observation, Clark's Grebes appear snowy white compared to Western Grebes and can be predicted at 100-200 m without the aid of binoculars or a spotting scope. I use the word "predicted" because this field mark should only be used as an aid to locating birds; the final conclusion as to species should be determined by facial pattern. I suspect the snowy white appearance is exaggerated by reflection off the water, not only from the whiter flanks, but also from the greater amount of white on the face region. Kaufman (1979) reports that Clark's Grebes have narrower black neck stripes, but my examination of museum specimens and extensive field observations have failed to disclose any differences in this character.

Downy young Clark's Grebes are nearly all white compared to Western Grebes. Especially noticeable is the lack of a black crown on Clark's Grebes prior to 45 days of age. Photographs and additional discussion of this difference in phenotypic development were reported by Ratti (1979:582).

*Bill color.* Western and Clark's grebes can also be distinguished by bill color — but, like the flank color, this difference is not as discrete as the facial pattern. The Western Grebe's bill color is dull greenish-yellow, and Clark's Grebes have brighter orange-yellow bills. I estimate that this color difference was consistent for 90+ % of the grebes I observed and collected in the past 5 years. Although this difference will appear obvious to the experienced observer, bill color alone should not be used to identify these species. In addition to individual variation, light conditions and water reflections can affect the appearance of bill color. Bill color of chicks was discussed by Ratti (1979).

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Figure 1. Western Grebe. The black crown feathers extend below the eyes



Figure 2. Clark's Grebe. The black crown feathers do not extend to the eyes and the flank region is speckled with white feathers.

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*Museum specimens.* Although museum specimens provide some advantages over field observations, preparation and drying may bias identification of Western and Clark's grebes that have narrow color margins below and above the eyes, respectively. Accurate classification of intermediate birds may be impossible for some museum specimens. My experience with Clark's Grebes collected in Utah indicates that the bright orange-yellow bills fade significantly several days after collection.

*Other characteristics.* I examined courtship behavior via general observation and limited footage of 16 mm color movies. My study of behavior was neither detailed nor quantitative, but indicated that no differences existed in courtship behavior. This conclusion has been recently confirmed by Nuechterlein (1981). Additional differences include the "Advertising" call: "Dark-phase birds had calls with two notes ('cree-cree'), while light-phase birds had one-noted calls ('cree')" (Nuechterlein 1981:335).

### DISTRIBUTION

*Relative abundance.* In most locations throughout the United States and Canada, the Western Grebe is more abundant than Clark's Grebe. Table 1 shows that of 2,373 *Aechmophorus* spp. observed in January 1977 at various locations in California and at Lake Mead, Nevada, only 11.6% were Clark's Grebes. While considering the relative abundance of birds reported in Table 1, the reader is cautioned not to assume that these data accurately represent the proportion of each species for wintering flocks at specific locations. Most of the winter data are from short-term observations that could easily bias the actual proportion of a species for a specific location. On the other hand, the overall observation of 11.6% is fairly representative of the general occurrence of Clark's Grebes among *Aechmophorus* spp. flocks in California during January 1977.

Summer observations of breeding populations are presented in Table 2. As with the wintering flocks, Western Grebes dominated most breeding populations, with the significant exception of Goose Lake, California, which had an estimated 90+ % Clark's Grebes. Presently, the Goose Lake breeding population is the largest known concentration of Clark's Grebe throughout its range. Surveys in 1981 of locations listed in Table 2 indicated that the proportion of Clark's Grebes remained similar to that found in 1977. However, surveys at Upper Klamath Lake in 1981 resulted in observations of 272 Western Grebes and 167 Clark's Grebes. Thus, I strongly suspect that Upper Klamath Lake has the second highest known concentration of breeding Clark's Grebes in the United States. Moore Park and Pelican Marina, in the city of Klamath Falls, Oregon, is the easiest observation site for Clark's Grebes of all the areas I have surveyed.

*Non-random distribution.* Field ornithologists should expect a non-random distribution of Clark's Grebes relative to Western Grebes. Table 1 demonstrates the clumped distribution of Clark's Grebes. For example, most flocks had 0-15%, but the flocks of grebes on Lake Berryessa and near Highway 75, south of Coronado, contained 49% and 75% Clark's Grebes, respectively. In addition, examination of specific mixed grebe flocks often will reveal Clark's Grebes are spatially segregated from Western Grebes. Spatial relationships are discussed in more detail by Ratti (1979:578-580).

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Table 1. Winter observations of Western and Clark's grebes in California and Nevada(\*), January 1977.

COUNTY	LOCATION	WESTERN GREBE		CLARK'S GREBE	
		N	(%)	N	(%)
Clark *	Lake Mead	321	(99)	3	(1)
Los Angeles	Los Angeles				
	Playa del Rey	36	(92)	3	(8)
	Knights Harbor	69	(97)	2	(3)
Orange	Newport Beach	21	(100)	0	(0)
Marin	Tiburon, Richardson Bay	859	(86)	136	(14)
	Tomales Bay	184	(91)	19	(9)
Monterey	Moss Landing, Monterey Bay	38	(100)	0	(0)
	Pacific Grove	25	(93)	2	(7)
Napa	Lake Hennessey	126	(85)	22	(15)
	Lake Berryessa	42	(51)	41	(49)
San Diego	Mission Bay Park				
	Quivira Basin	67	(100)	0	(0)
	S.D. Flood Control Channel	29	(83)	6	(17)
	Hwy 75, South of Coronado	9	(25)	27	(75)
	Harbor Island, San Diego	184	(95)	10	(5)
Santa Clara	Anderson Lake	11	(92)	1	(8)
Sonoma	Bodega Bay	6	(75)	2	(25)
	Jenner	71	(99)	1	(1)
TOTALS		2,098	(88.4%)	275	(11.6%)

Table 2. Summer observations of Western and Clark's grebes in California, Oregon and Utah, June and July 1977.

STATE AND COUNTY	LOCATION	WESTERN GREBE		CLARK'S GREBE	
		N	(%)	N	(%)
CALIFORNIA:					
Siskiyou	Lower Klamath				
	National Wildlife Refuge	65	(79)	17	(21)
	Tule Lake National				
	Wildlife Refuge	242	(87)	36	(13)
Modoc	Goose Lake	34	(5)	598	(95)
Lassen	Eagle Lake	120	(98)	2	(2)
OREGON:					
Harney	Malheur Lake	26	(100)	0	(0)
Klamath	Upper Klamath Lake	37	(51)	35	(49)
UTAH:					
Box Elder	Bear River Migratory				
	Bird Refuge	280	(75)	92	(25)

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### SUMMARY

Clark's Grebes are phenotypically separable from Western Grebes by the black and white facial pattern. The black crown of the Clark's Grebe does not extend to the eyes; thus, the eyes are completely surrounded by white feathers. Western Grebes have black crown feathers extending below the eyes, so that the eyes are completely surrounded by dark feathers. Other phenotypic differences include the brighter orange-yellow (less greenish) bill and whiter flanks of Clark's Grebes.

Western Grebes numerically dominate most sympatric populations in the United States and Canada. The distribution of Clark's Grebes often appears "clumped" due to their behavioral tendency of spatial segregation.

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