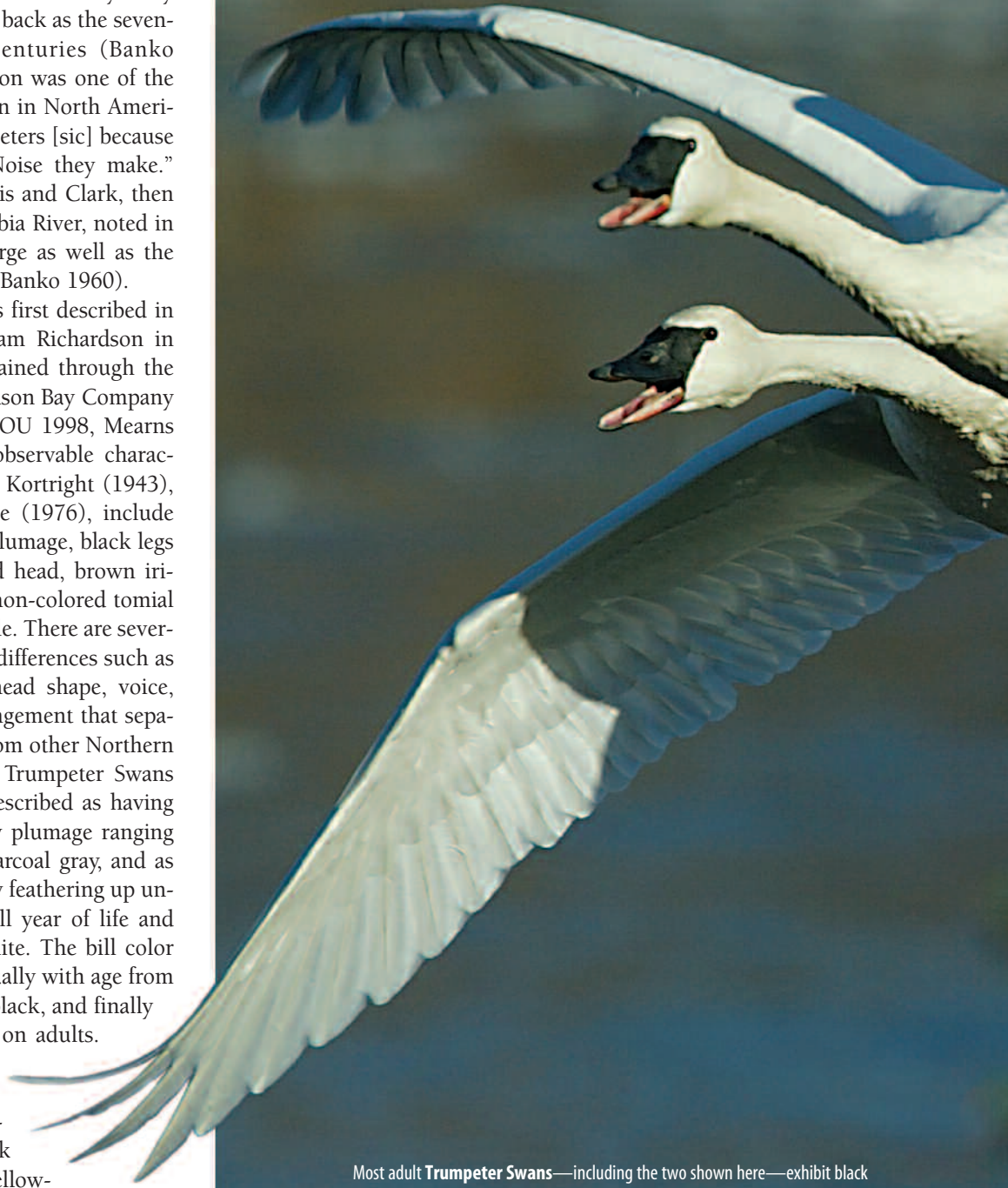


WATERFOWL BIOLOGY

The first swan species to be described in North America was the Tundra Swan (formerly called the Whistling Swan), back in 1815 (AOU 1998), but other suspected types of swans were mentioned by early settlers and explorers as far back as the seventeenth and eighteenth centuries (Banko 1960). In 1709, John Lawson was one of the first to note a different swan in North America—"the one we call Trompeters [sic] because of a sort of Trompeting Noise they make." Nearly a century later, Lewis and Clark, then at the mouth of the Columbia River, noted in the spring of 1806 "the large as well as the small, or whistling, swan" (Banko 1960).

The Trumpeter Swan was first described in anatomical detail by William Richardson in 1831 from a specimen obtained through the swan-skin trade by the Hudson Bay Company in Hudson Bay, Canada (AOU 1998, Mearns and Mearns 1998). Field-observable characters for adults, reported by Kortright (1943), Banko (1960), and Bellrose (1976), include the following: pure-white plumage, black legs and feet, a straight-profiled head, brown irides, a black bill, and a salmon-colored tomial streak on the lower mandible. There are several anatomical and physical differences such as size, weight, loreal color, head shape, voice, sternum, and tracheal arrangement that separate the Trumpeter Swan from other Northern Hemisphere swans. Young Trumpeter Swans (called cygnets) are best described as having different gradations of gray plumage ranging from dusky to sooty to charcoal gray, and as having various tones of gray feathering up until they reach their first full year of life and turn almost completely white. The bill color of cygnets transforms gradually with age from pink, to pink bordered by black, and finally to all-black, like that seen on adults.

The feet of cygnets can vary in color from pink or pinkish-gray (personal observation), to grayish-pink (Mitchell 1994), to faint yellow-gray, to olive-gray and black (Banko 1960). But they are usually gray or black, tinged with various amounts of brown, yellow, or olive.



Most adult **Trumpeter Swans**—including the two shown here—exhibit black legs and feet. But careful observers at Yellowstone National Park, Wyoming, have been noting variants with pink, orange, and yellow bare-parts. This article describes these variants and speculates about the possible causes of bare-part variation in the Trumpeter Swan. *Monticello, Minnesota; 1 November 2003. © Stan Tekiela.*

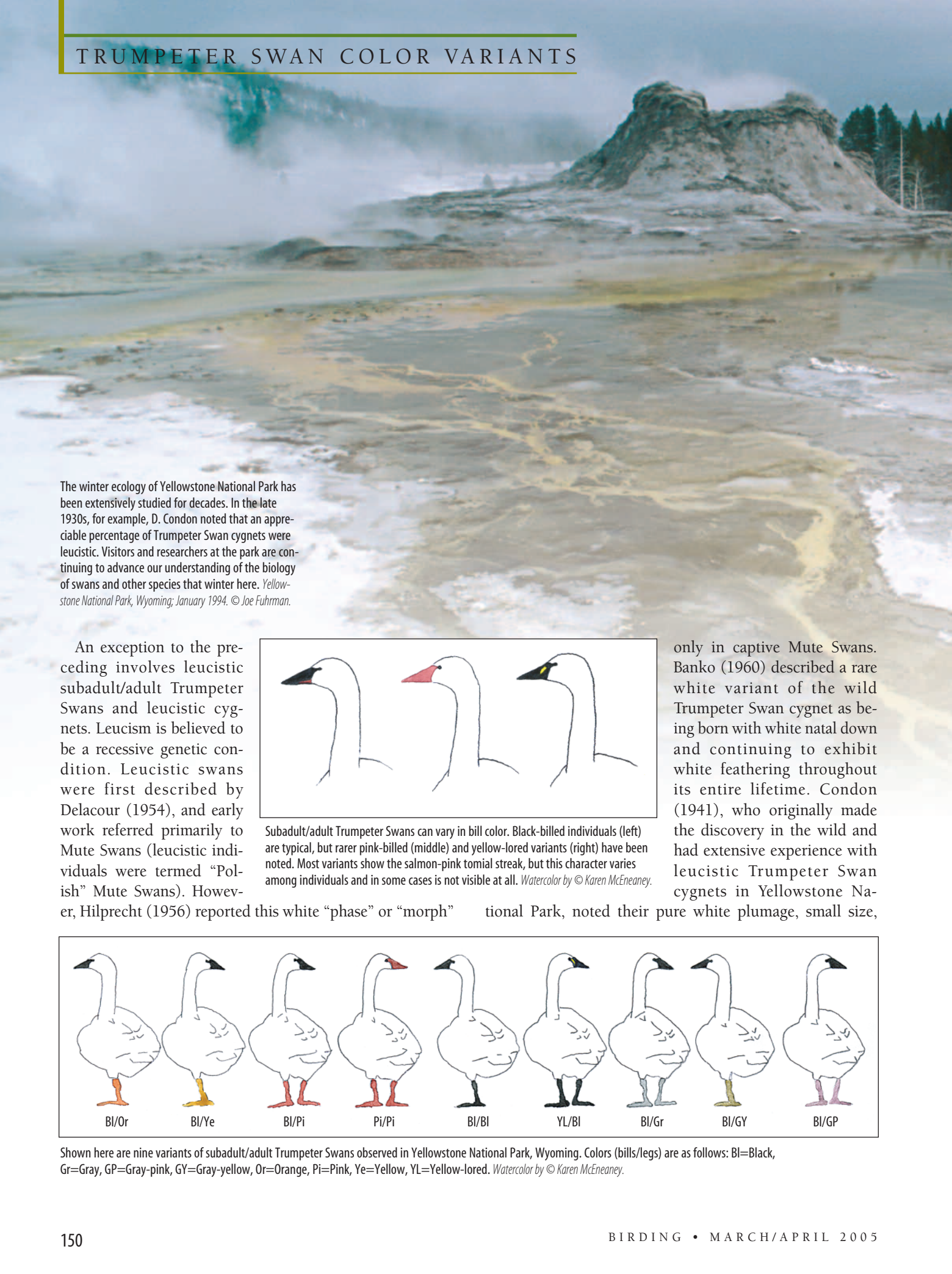


Rare Color Variants
of the Trumpeter
Swan

Terry McEneaney

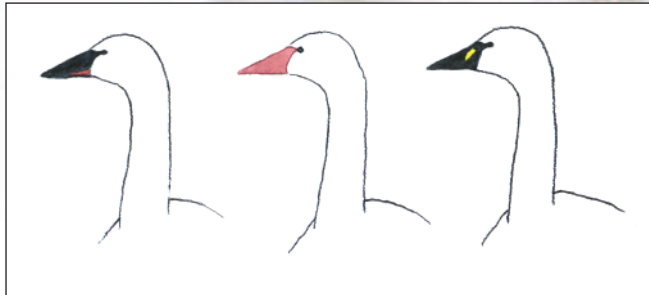
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TRUMPETER SWAN COLOR VARIANTS



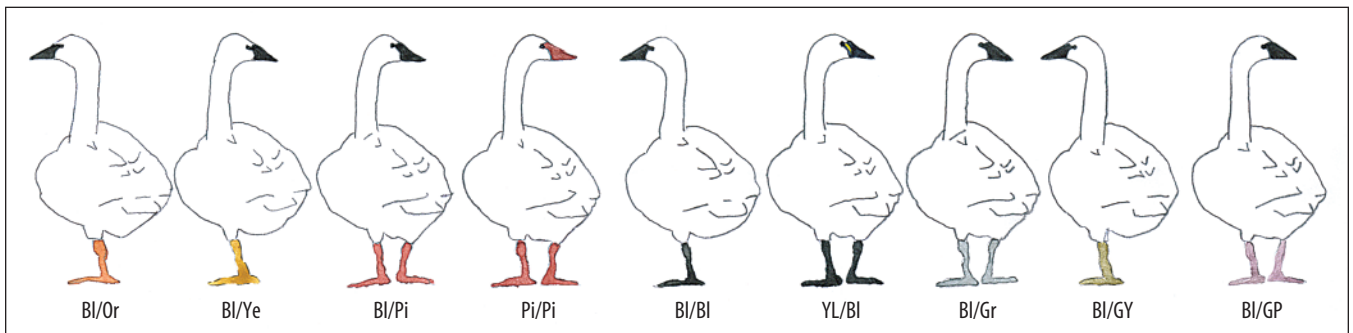
The winter ecology of Yellowstone National Park has been extensively studied for decades. In the late 1930s, for example, D. Condon noted that an appreciable percentage of Trumpeter Swan cygnets were leucistic. Visitors and researchers at the park are continuing to advance our understanding of the biology of swans and other species that winter here. *Yellowstone National Park, Wyoming; January 1994. © Joe Fuhrman.*

An exception to the preceding involves leucistic subadult/adult Trumpeter Swans and leucistic cygnets. Leucism is believed to be a recessive genetic condition. Leucistic swans were first described by Delacour (1954), and early work referred primarily to Mute Swans (leucistic individuals were termed “Polish” Mute Swans). However, Hilprecht (1956) reported this white “phase” or “morph”



Subadult/adult Trumpeter Swans can vary in bill color. Black-billed individuals (left) are typical, but rarer pink-billed (middle) and yellow-ored variants (right) have been noted. Most variants show the salmon-pink tomial streak, but this character varies among individuals and in some cases is not visible at all. *Watercolor by © Karen McEneaney.*

only in captive Mute Swans. Banko (1960) described a rare white variant of the wild Trumpeter Swan cygnet as being born with white natal down and continuing to exhibit white feathering throughout its entire lifetime. Condon (1941), who originally made the discovery in the wild and had extensive experience with leucistic Trumpeter Swan cygnets in Yellowstone National Park, noted their pure white plumage, small size,



Shown here are nine variants of subadult/adult Trumpeter Swans observed in Yellowstone National Park, Wyoming. Colors (bills/legs) are as follows: BI=Black, Gr=Gray, GP=Gray-pink, GY=Gray-yellow, Or=Orange, Pi=Pink, Ye=Yellow, YL=Yellow-ored. *Watercolor by © Karen McEneaney.*



pinkish bill, and yellowish legs turning shades of gray with age.

Observations from Wyoming and Montana

While conducting winter Trumpeter Swan surveys in and near Yellowstone National Park, I and others have observed some bright orange-/yellow-/pink-legged, bright pink-billed, and yellow-lore variants of the Trumpeter Swan that warrant detailed description. Below, I discuss in a fair bit of detail some recent sightings (*Birds 1–4*), and then provide some general information on earlier records (*Birds 5–10*).

Bird 1. From 10 January through 1 February 2003, a gray Trumpeter Swan cygnet with dark-brown eyes, bright golden-yellow legs, and orange feet was observed on the Madison River in Yellowstone National Park, Wyoming. The cygnet was identified as a Trumpeter Swan by its head and culmen profile, large feet, and call. It was spending its time as part of a family group that numbered two adults and four cygnets. The individual in question was in gray plumage with some bleaching on the mantle, back, and flanks. Its bill was bright pink, thinly outlined



Subadult/adult Trumpeter Swans can vary in leg and foot color. Color varies from the more-typical black coloring (top) to oddities such as gray, gray-yellow, and gray-pink (right) to even rarer variants such as orange, yellow, and pink (left). Watercolor by © Karen McEneaney.

in black, and much brighter pink than the bills of the hundreds of other Trumpeter Swan cygnets that frequented Yellowstone National Park at the time. The three other cygnet members of this family group had slightly darker-gray plumage, with solid gray-black bills, legs, and feet. A color photo was taken of this individual (see figure, p. 153, bottom).

Bird 2. On 22 January 2003, while conducting a weekly winter Trumpeter Swan survey by snowmobile, I observed one subadult/adult Trumpeter Swan that appeared to have bright orange legs; it was flying upstream with seven other swans on the Firehole River in Yellowstone National Park. Its calls, a diagnostic feature in swan identification, indicated that it was a Trumpeter Swan. This bird was not photographed.

Birds 3 & 4. On 28 January and 11 February 2003, while conducting park-wide winter Trumpeter Swan aerial surveys on the Madison Arm of Hebgen Lake, Montana, pilot Roger Stradley and I observed two white Trumpeter Swan subadults/adults with bright orange legs and feet. These splendidly odd individuals were identified as Trumpeter



This adult Trumpeter Swan with **yellow legs and feet** was present on the Yellowstone River, Yellowstone National Park, Wyoming, throughout the winter of 2003–2004. © Terry McEneaney.



Coloration of soft parts can be deceiving on birds in the water or on the snow, due to reflection and film used. This adult Trumpeter Swan was decidedly **pink-legged**. It paired with a typical adult in Lamar Valley, Yellowstone National Park, Wyoming, in the early 1990s. © Terry McEneaney.

Swans based on body and foot size, plus their characteristic head-bobbing and wing-fluttering behavior; also, they were closely mixed in with a group of 409 Trumpeter Swans using the lake. The birds were detected because they were standing on the ice out of water, and the setting sun was shining on their bright-colored legs and feet. The maxillae (or upper mandibles) of these odd swans were black, with the lower mandibles black with a salmon-colored tomial steak—typi-

cal of Trumpeter Swans of that age. We flew close enough to determine that they were Trumpeter Swans based on their physical appearance, as well as on behavioral cues (head-bobbing and wing-fluttering). These two subadult/adult swans were not always together, but instead were found in different night-roost groups that were 100 meters apart and included 25–40 swans. We compared their characteristics to those of two smaller Tundra Swans found on this same lake and isolated from the larger group of Trumpeter Swans. See figure, p. 153, top.

Birds 5–10. Interestingly, I observed another lone Trumpeter Swan exhibiting the same characters (black bill, orange legs) as birds #3–4 throughout the 2003–2004 winter. The bird was >15 kilometers from birds #3–4 and not, I believe, one of the Hebgen Lake birds. Earlier, in the mid-1980s, three different adults with bright pink bills and legs repeatedly wintered at ponds at Red Rock Lakes, Montana (personal observation). Also, from November 2002 through January 2003, two adults with bright pink bills and legs frequented the Yellowstone River / Yellowstone Lake, Wyoming, area. See the illustrations, pp. 150–151, for further details.

Discussion

Hybridization in captive swans is well documented, but these Wyoming swans did not appear to be hybrids because they differed from pure/parental Trumpeter Swans only in leg and/or bill color. In captivity, Trumpeter Swans have been noted to hybridize with Mute, Tundra, Whooper, and Bewick's Swans (Sibley 1938, Banko and Schorger 1976). Additional Mute × Trumpeter hybrids are appearing in the wild in North America (A. Breault, personal communication), and Trumpeter × Tundra crosses can be fertile (Banko 1960). All known instances of swan hybridization have involved Northern Hemisphere hybrid swans with black legs. (There are

only three wild swans in the Southern Hemisphere: the Black Swan, *Cygnus atratus*, the Black-necked Swan, *C. melanocoryphus*, and the Coscoroba Swan, *Coscoroba coscoroba*. The Black Swan is an Australian endemic with a red bill and legs; the Black-necked Swan of southern South America has a black bill and pink legs; and the Coscoroba Swan, also native to South America, has an orange bill and legs.) Now, for the first time, this article provides docu-

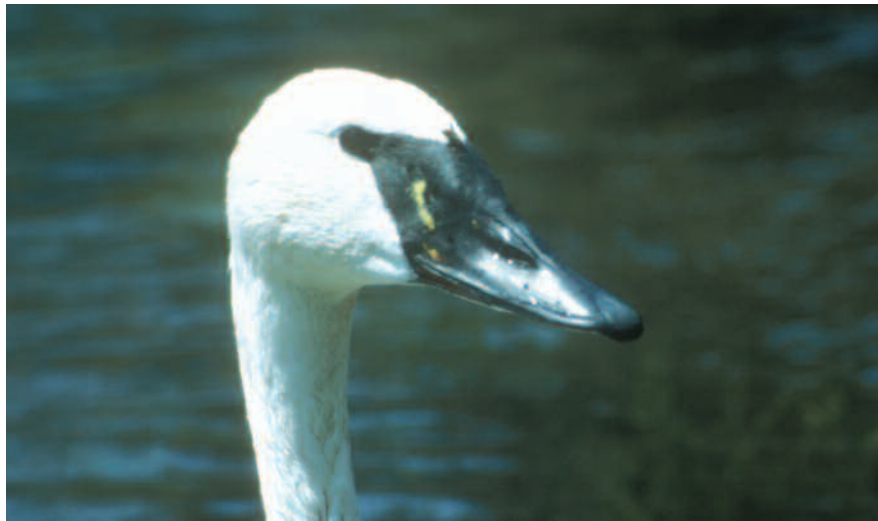
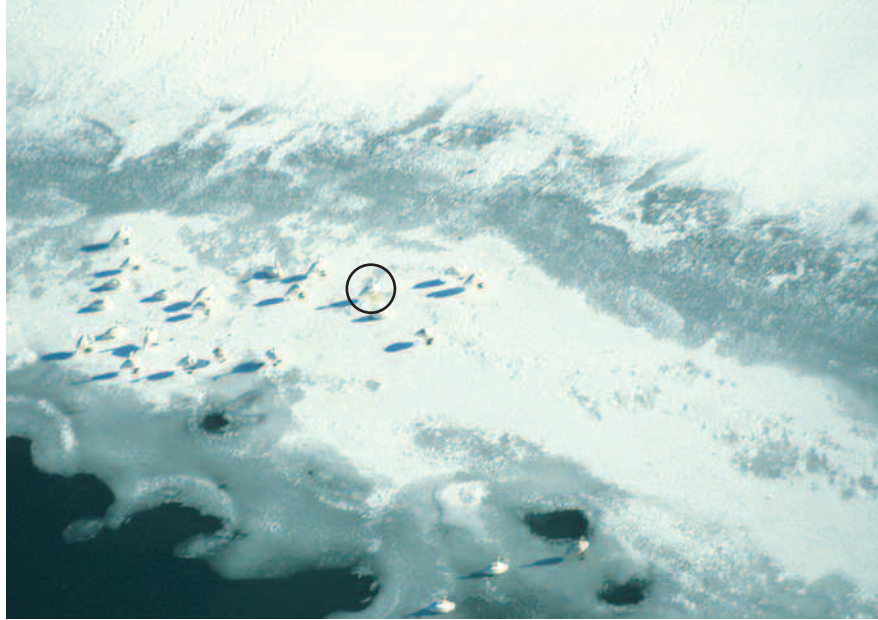
The circled bird, photographed at Hebgen Lake, Montana, on 11 February 2003, shows the typical black bill of an adult Trumpeter Swan, but note that it has **bright red-orange legs**. © Terry McEneaney.

mentation of orange-/yellow-/pink-legged, pink-billed, yellow-lored Trumpeter Swans.

Descriptions of strange swan variants or types from Eurasia have obscurely appeared in the literature. Swinhoe (1870) described a swan collected by Pere (Abbé) David in China as the David's Swan and assigned this most unusual find the scientific name *Coscoroba davidi*. The single specimen often referred to as the David's Swan of China was described as being an all-white swan, slightly smaller than a Bewick's Swan, with feathering between the eyes and bill. In addition, the bill was vermillion in color yet still retaining the black nail, while the legs and feet were orange-yellow (Brazil 2003). Disappointingly, the specimen has been lost to the scientific world; however, some considered it probably to have been a goose/swan hybrid, while others classified it as a separate species, placing it close to the Coscoroba Swan and uniquely by itself; hence, *Coscoroba davidi* (Mearns and Mearns 1998, Brazil 2003). Scott (1972) regarded this problematic bird as a genetic anomaly, placing it with the likes of leucistic juvenile Bewick's Swans, Trumpeter Swans, and "Polish" Mute Swans.

Rees et al. (1991) mentioned finding three Bewick's Swans in Europe with orange or yellow legs. In addition, yellow-lored Trumpeter Swans closely resembling Tundra Swans have also been observed both in captivity (B. Elgas, personal communication) and in the field. A yellow-lored Trumpeter Swan that occupied a nesting territory at the Seven Mile Bridge on the Madison River in Yellowstone National Park for several years in the late 1980s was incorrectly reported by both experienced and inexperienced observers as a Tundra Swan (see middle figure, this page).

Should these rare Trumpeter Swans with non-black bare parts be considered genetic anomalies? Perhaps, but there is another plausible explanation. The curiosity about these rare individuals led me to search field notes collected over two decades. Field notes and swan photographs suggested that these subadult/adult swans were likely rare leucistic variants of the Trumpeter Swan. Yellowstone National Park has traditionally had a



This adult Trumpeter Swan with **yellow lores** was present year-round along the Madison River, Yellowstone National Park, Wyoming in the early 1990s. Park visitors repeatedly misidentified this bird as a Tundra Swan, an understandable mistake. © Terry McEneaney.



This interesting cygnet, photographed along the Madison River, Yellowstone National Park, Wyoming, on 22 January 2003, showed **yellow legs and orange feet**. Its pink bill does not show well in this photograph. © Terry McEneaney.

high incidence of leucism (Banko 1960). During his 1937–1940 field seasons, Condon (1941) found that 9 out of 67 (13%) cygnets from Yellowstone National Park were leucistic. Leucistic cygnets are subject to high rates of predation due to their conspicuous plumage, and few survive to subadulthood/adulthood. I examined personal field accounts that traced leucistic Trumpeter Swans from hatchling to subadulthood/adulthood, and I found a high degree of individual variability in the few records in existence. Three previous records (personal observation) of leucistic adult Trumpeter Swans indicated that bill color remained black and that the legs remained dull-yellow in two out of three cases. In the third instance, a unique individual was observed with a black bill, faint yellow lores, and dull-yellow legs.

Field observers should be aware that rare color variants of the Trumpeter Swan do exist in the wild. The phenomenon has not been adequately documented in detail in the literature, and the genetic or environmental mechanisms at play here are poorly understood. Birders can advance our understanding of the situation by making careful notes of aberrant swans in the field and, in particular, by monitoring aberrant individuals for as long as possible. Observations of individual birds from the cygnet stage all the way to adulthood would be of special value.

Acknowledgments

Special thanks go out to Roger Stradley for his excellent pilot skills during swan surveys. Also I would like to thank Jonathan Alderfer, Becky Anthony, Jon L. Dunn, Ted Floyd, Kerry Murphy, Tom Olliff, and Glenn Plumb for providing helpful editorial comments on the manuscript. Thanks also to park visitors and employees for keeping me abreast of these unusual swans. And lastly, thanks to my wife Karen

McEaney for the paintings, reproduced in this article, of the various color variants of the Trumpeter Swans found in the Greater Yellowstone area.

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