guides and scientific papers? The error stems from at least two sources. Huxley, apparently, was under the impression that all Gyrfalcons fell into one of three color categories; therefore, he referred to them as *morphs.* Second, some authors have expanded the original definition of *morph.*

> "Morph—term used for recognizably different forms of a species, usually color related. Color morphs are dark, rufous, and light." (Wheeler and Clark 1995, A photographic guide to North American raptors, Academic Press, San Diego, CA U.S.A.).

Frank Beebe (pers. comm.) agrees that the concept of three Gyrfalcon morphs is misleading to some ornithologists and birdwatchers. For example, at some locations white Gyrfalcons have all-white tails, while at other locations they have conspicuously barred tails.

A few field guides refer to the white, gray, and dark *phases* of the Gyrfalcon. For some the term *phase* implies a change with time, and sometimes it refers to synchronization; therefore, its use with reference to Gyrfalcons is not appropriate. It is akin to referring to *blue phase* Rock Doves (*Columba livia*).

What is the appropriate terminology for Gyrfalcons? Cade (pers. comm.) now prefers *color variants.* Thomson (1964, [ED.], A new dictionary of birds, McGraw-Hill, New York, NY U.S.A.) suggested the term *form,* and provided the following definition:

> "Form, in taxonomy, a loose or deliberately neutral term for a species or sub-division thereof, non-committal as regards rank or status to be assigned to it."

This problem in semantics is best resolved by understanding the causes for the unusual color variation. Cade (pers. comm.) hypothesized that the three broad color groups are a result of geographic isolation in Pleistocene refugia during the past 100 000 years or so. He believes that the white birds evolved in isolation in the Ellesmere Island–north Greenland refugium. A melanistic form may have evolved in another refugium around Labrador; while the original or ancestral gray gyrs were restricted to habitats south of the continental ice sheets in North America and Eurasia. When the ice retreated, the breeding ranges of the various forms merged and, because no reproductive isolating mechanisms had evolved, the three color variants (originally geographic in origin), have freely interbred to produce the present distribution and range of variants we see in the Gyrfalcon's plumage.

In any case, it is clear that there is a color continuum in Gyrfalcons, and not in screech owls, and that the term *morph* is being used for both patterns of morphological variation. I suggest the term *morph* is most appropriate for discontinuous variants and not the Gyrfalcon.

I would like to thank T.J. Cade for his assistance over the years, and E. Potapov and referees D. Bird, A. Jenkins, and P. Koskimies for their helpful comments.—**Ian Flann, 1067 Wiseman Crescent, Ottawa, Ontario, K1V 8J3, Canada.**

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TWO WHITE-TAILED SEA EAGLES (*HALIAEETUS ALBICILLA*) COLLIDE WITH WIND GENERATORS IN NORTHERN GERMANY

Recently, the issue has arisen whether wind generator structures may have a significant impact on bird populations. The sustainable use of wind energy has led to a substantial increase in the number of wind-power plants in Germany. In the last 5 yr, the number of wind turbines has doubled. In the year 2000, wind power plants generated more than 6113 MW power, or 2.4% of the total energy power consumption in Germany. Especially windy areas in the northern parts of Germany, where large numbers of waders and water birds live, are favored by this development. Studies on these bird groups revealed that wind power plants have a substantial effect on the behavior of these birds through disturbance, harassment, and loss of habitat, rather than the direct mortality due to collisions (Exo 2001, *Natur und Landschaftsplanung* 33:323).

The White-tailed Sea Eagle (*Haliaeetus albicilla*) is still listed as a threatened species in the red data book of Germany (Witt et al. 1998, In: Binot et al. *Rote Liste gefährdeter Tiere Deutschlands, Bundesamt für Naturschutz,* 40–47), although the population has doubled in the last 10 yr, reaching 381 territorial pairs in 2001. The core population that has

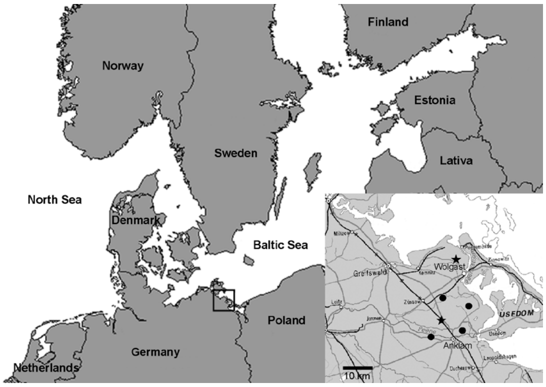

Figure 1. Map of the Baltic Sea with its surrounding states. Inset showing strike locations; i.e., wind power plants (asterisks) and breeding sites (closed circles) in northeastern Germany.

supported the increase and expansion of this eagle population lies within the federal state of Mecklenburg-Western Pomerania in northwestern Germany with 174 territorial pairs in 2001 (Kollmann et al. 2002, *Corax* 19:1–14).

A White-tailed Sea Eagle was found dead in a wind power plant in northeastern Germany in the federal state of Mecklenburg-Western Pomerania on 26 January 2002. The park consisted of two rows with 20 single turbine towers, each 65 m tall with a rotor of 41 m in diameter (maximum height = 85 m) and is located north of the town of Wolgast in the coastal area of the Baltic Sea (Fig. 1). Prior to the collision, it was very windy, with mean wind speeds between 30 and 40 km/hr and maximum speeds of 90 km/hr. Necropsy at the Institute for Zoo and Wildlife Research (IZW), Berlin, revealed a displacement of the thoracic vertebral column with fractures of two vertebrae and several broken ribs on both sides. The adult female eagle was in very good body condition and no signs of a disease were identified. The accident may have been caused by a squall, which took the eagle into the propeller while it was hunting.

Another White-tailed Sea Eagle was directly observed when hit by a propeller of a wind generator in a plant consisting of seven generators of the same type mentioned above and located in one row in Mecklenburg-Western Pomerania near the town of Anklam, also in the coastal area of the Baltic Sea on 1 April 2002 (Fig. 1). Residents walked near this wind power plant in sunny weather (17–18°C) when they heard a dull noise at 0920 H CET; they turned and saw the eagle falling to the ground. No behavior to avoid the strike by the rotor was observed, because the event was first recognized when the sound of the collision was heard. The eagle was a subadult 4-yr-old male and it was brought injured to a veterinarian who diagnosed a multiple fracture of the right radius and ulna. The veterinarian attempted to align the bones, but was unsuccessful. Subsequently, the bird was euthanatized due to the development of the severe osteomyelitis in the right ulna and radius. The eagle was ringed in June 1998 in an eyrie on the island of Usedom ca. 25 km northeast of the location where the bird collided with the wind turbine.

This is the first report of White-tailed Sea Eagles being killed by wind turbines. Previous studies on causes of death of White-tailed Sea Eagles in Germany did not mention casualties by wind generators (Oehme 1966, *Falke,* 13:40–47; Struwe-Juhl and Latendorf 1997, *Vögelwelt,* 118:95–100; Krone et al. *in press, Proc. Conf. Sea Eagle 2000, Björko, Sweden*).

The northeastern part of the federal state of Mecklenburg-Western Pomerania borders on the Baltic Sea, with waters draining from the island of Usedom and the Peene stream from the mainland in close proximity. The waters are rich in fish and waterfowl, providing a food source for several breeding pairs of eagles, and supporting high numbers of migrating and wintering individuals. The landscape largely consists of cultivated areas interspersed with patches of deciduous and mixed forests. The climate of the region is strongly influenced by the Baltic Sea resulting in a delayed spring, relatively cold and wet summers and mild winters with little snow. The mean temperature of the year is 8.1°C with a mean rain fall of 584 mm. The preceding wind direction is southwest.

Incidents such as these are likely to occur in areas with large raptor populations and a high prey base for raptors. Estep (1989, *Unpubl. Rep. California Energy Commission, Sacramento, California*) documented collisions with wind turbines by 72 raptors of seven species at two Wind Resource Areas (WRA) in California (Altamont Pass and Tehachapi Pass). The Golden Eagle (*Aquila chrysaetos*) and the Red-tailed Hawk (*Buteo jamaicensis*) were the most frequently reported species, comprising 86% of the collision incidents. Fatalities were reported year round, affecting local as well as migrating and wintering birds. During a 4-yr investigation of 179 radio tagged Golden Eagles, 61 deaths were recorded, of which 23 were caused by wind turbine blade strikes. Non-territorial Golden Eagles often visited the WRA, whereas breeding eagles rarely entered the WRA (Hunt et al. 1999, Report to the National Renewable Energy Laboratory, XAT-5-15174-01, XAT-6-16459-01, Predatory Bird Research Group, University of California, Santa Cruz, CA U.S.A.). However, a review of different sources of avian collision mortality in the United States indicated that death associated with wind plants is much lower than other sources of collision mortality (Erickson et al. 2001, National Wind Coordinating Committee, Washington, DC U.S.A.). The high levels of raptor mortality at Altamont were explained by large raptor populations, a high prey base for raptors, and the large size of the wind plant. A study performed in the Campo de Gibraltar region in Spain, a major passway of bird migration to Africa, also demonstrated the severe impact of a wind farm on large birds (Montes and Jaque 1995, Summary of final report, Soc. Espan. Ornitol.). Of 82 birds found after collisions with wind generators, five raptors were affected, of which the Griffon Vulture (*Gyps fulvus*) was most common (43 collisions).

In contrast to the wind power facility in California, the wind power plants in Mecklenburg-Western Pomerania are much smaller, but this is an important area for migrating and wintering White-tailed Sea Eagles in the Baltic Sea region. Systematic studies on wind turbines to examine their full range effects on behavior, reproductive success, and mortality of raptors are strongly needed for Germany, as there are plans to enlarge the total energy generated by wind in Germany in the near future.

We are grateful to F. Seemann from the Mueritz Museum Waren and to the editor and anonymous referees for their helpful suggestions.**—Oliver Krone, Institute for Zoo and Wildlife Research, P.O. Box 601103, D-10252 Berlin, Germany; e-mail address: krone@izw-berlin.de and Christian Scharnweber, State Office for Environment and Nature, Dorfstr. 86, D-17392 Putzar, Germany.**

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TALON-LOCKING IN THE RED-TAILED HAWK

Talon-locking by two Red-tailed Hawks (*Buteo jamaicensis*) in flight is widely accepted (e.g., Ferguson-Lees and Christie 2001, Raptors of the world, Houghton Mifflin, Boston, MA and New York, NY U.S.A.), although it appears to have been well described in the literature only once (Warren 1890, Report on the birds of Pennsylvania, 2nd Ed., Harrisburg, PA U.S.A.), who observed it during fall migration. He was cited by Bent (1937, Life histories of North American birds of prey, Part 1, U.S. Natl. Mus. Bull. 167, Washington, DC U.S.A.) and Palmer (1988, Handbook of North American birds, Vol. 5, Diurnal raptors, Yale Univ. Press, New Haven, CT U.S.A.), who also briefly described the behavior seen in the spring, which he interpreted as one bird being a territory holder and the other an interloper. Palmer was cited by Preston and Beane (1993, *in* A. Poole and F. Gill [Eds.], The birds of North America, No. 52. The Academy of Natural Sciences, Philadelphia, PA and The American Ornithologists' Union, Washington, DC U.S.A.). Voelker (1969, *Loon* 41:90–91) witnessed courting birds locking bills in flight and falling to the ground, and he quotes another observer who reported courting birds locking bills or feet and falling to the ground. Both of those observations were made in March.

On 24 January 2000, two Red-tailed Hawks (*Buteo jamaicensis calurus*) were recovered under an electrical transformer near the entrance to the National Guard Armory in Santa Fe, New Mexico by the Public Service Company of New Mexico. They had been electrocuted and partially burned; all four of their talons were locked together. One was in normal definitive plumage, the other was a dark-phase bird with a sub-definitive banded tail. Both birds were females with ovaries measuring 8×20 and 8×15 mm, respectively. They were too burned to be preserved.

This incident of talon-locking between female Red-tailed Hawks occurred in January, suggesting aggressive interaction, in which one hawk was attempting to displace another hawk that was perched on the pole with a transformer. With talons locked the two birds made contact with two wires resulting in electrocution.

I wish to thank Anne Sanchez of the Public Service Company of New Mexico for presenting these birds to the Museum of Southwestern Biology, and the reviewers of this note for their helpful suggestions.**—Robert W. Dickerman, Museum of Southwestern Biology, University of New Mexico, Albuquerque, NM 87131 U.S.A.; e-mail address: bobdickm@unm.edu**

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