Interspecific Mate Choice and Hybridism in the Bufflehead, *Bucephala albeola*

JAMES K. FINLEY[1] and SUZANNE HUOT[2]

[1] 10232 Summerset Place, Sidney, British Columbia V8L 4X2 Canada; corresponding author: jameskfinley@telus.net
[2] Cloake Hill Road, North Saanich, British Columbia V8L 5J9 Canada; suzannenaturephoto@shaw.ca

Finley, James K., and Suzanne Huot. 2010. Interspecific mate choice and hybridism in the Bufflehead, *Bucephala albeola*. Canadian Field-Naturalist 124(1): 28–31.

Observations of a male Bufflehead (*Bucephela albeola*) paired with a female Common Goldeneye (*Bucephela clangula*) in northern Alberta in 1995 and of a hybrid male Common Goldeneye × Bufflehead photographed near Victoria, British Columbia, in March 2009 provide the first combined evidence of interspecific mate choice and out-crossing in *Bucephala albeola*. Since 1999, there have been at least 10 unofficial records, including photographs, of Common Goldeneye × Bufflehead hybrids posted on the Internet, as well as 6 records of hybridization with Hooded Mergansers (*Lophodytes cucullatus*). In all cases, where evident in Common Goldeneye × Buffleheads, gold eyes and pink feet were expressed and social affiliation was with Common Goldeneyes, suggesting matrilineage with that species. Because most attention is given to the hybrid—and to male hybrids at that—rather than to the progenitors, the theory of mate attraction, through sexual imprinting of males, is biased toward the paternal viewpoint. It appears that there is more plasticity in mate choice, particularly by the female. The opportunity to observe mate choice is much rarer than the hybrid outcome, while the odds of the latter have increased many fold in the last decade due to advances in Internet communication and digital photography. This exercise illustrates the ability of the Internet to amplify the prevalence of rare phenomena many fold over historical records.

Key Words: Sea ducks, Mergini, Bufflehead, *Bucephala albeola,* goldeneyes, *Bucephala* spp., interspecific mate choice, hybridism, British Columbia.

In his monograph on Buffleheads (*Bucephala albeola*), Erskine (1972: 196) stated that "The bufflehead is distinctly a North American duck, but it is one of a group of species which extend right around the Northern Hemisphere and which are collectively referred to as the seaducks [the Mergini tribe] since they commonly winter on saltwater." The seaducks, or Mergini tribe, is a motley tribe, consisting of four closely related Palearctic genera, each with three species – the *Bucephala* genus including Common Goldeneye (*Bucephala clangula*), Barrow's Goldeneye (*B. islandica*), and Bufflehead; the scoters (*Melanitta* spp.); the mergansers (*Mergus* spp. and *Lophodytes cucullatus*); and the eiders (*Somateria* spp. and *Polysticta stelleri*). Many of these ducks are noted for their distinctive facial badges. At the time Erskine was writing his monograph, there were no known hybrids of Buffleheads, although in the delay between writing and publication, Erskine did learn of a putative hybrid with a goldeneye (*Bucephala* sp.).

The Bufflehead is the smallest of the three goldeneyes, and it faces competition for nesting cavities, strong aggression, and even infanticide from female goldeneyes. The goldeneyes are most closely related to the mergansers, and there are several records of hybrids between the Common Goldeneye and the Hooded Merganser (*Lophodytes cucullatus*) in North America and with the Smew (*Mergus albellus*) in Europe (Johnsgard 1965). In contrast, Gauthier (1993) noted that there were only two putative cases of out-crossing of the Bufflehead: a possible cross with a goldeneye from a wing sample in Ontario and a sighting of a presumed cross with a Hooded Merganser in Illinois.

The Bufflehead's small size, its specialized niche in tree-cavity nesting, distinctive courtship display, and strong competition with its closest cousins, the goldeneyes, make interbreeding unlikely. Given the vast and fairly remote breeding habitat of goldeneyes, it would be even less likely for anyone to observe such aberrant pairing; it is more likely that the hybrid itself would be seen on the wintering grounds. Thus, given the state of knowledge at the turn of this century, one would not have expected to encounter either a mixed pair or their offspring in a lifetime. JKF has been fortunate to have seen both cases. What began as a simple anecdote has turned into a short essay on the nature of hybridism.

Observations

On 20 May 1995, as JKF crossed over a small bridge on a stream flowing out of Swan Lake (55°31'33"N, 120°01'55"W), 35 km south of Dawson Creek, British Columbia, he glimpsed a Bufflehead drake hauled out on a log in close company with a Common Goldeneye hen. Because it was close to a provincial park campground, he was able to observe the pair over the next two days. Clearly they were paired, and the female goldeneye occupied a nest cavity in a Balsam Poplar (*Populus balsamifera*), visible from the bridge. When she was in the nest, the Bufflehead remained close by, and he joined her when she left. Judging from the hen's behaviour, egg laying was well under way. Attempts to

photograph the pair were unsuccessful and when disturbed they flew to the nearby lake, which was occupied by at least 20 Common Goldeneyes, many in courtship.

The incident was intriguing, since the goldeneye had plenty of her kind to choose from. Meanwhile, because both species occupied winter habitat in front of JKF's home on Shoal Harbour Migratory Bird Sanctuary, JKF began to study Bufflehead behaviour in earnest (Finley 2007a, 2007b), as well as on their breeding grounds in the interior grasslands of British Columbia. JKF presumed that the opportunity to verify his earlier observations of pair-bonding was highly unlikely.

JKF was surprised then, when on 21 March 2009, SH called him and asked whether he had ever heard of a Bufflehead × goldeneye cross. She was certain that she'd just photographed such a bird in Esquimalt Lagoon Migratory Bird Sanctuary, near Victoria (48.43°N, 123.47°W). She forwarded several images, and had indeed taken a photograph of a male hybrid *Bucephala albeola* × *B. clangula* (Figure 1). Most notable was the distinctive white head patch, a combination of both species. Features that were clearly Bufflehead included its head shape, white scapular plumage, pink feet, blue-grey bill, and greyish tail. Common Goldeneye attributes included its yellow eye, green iridescence, larger bill, and its "head-throw" courting posture.

On the following day, JKF observed the bird closely amongst a frenzy of Mallards (*Anas platyrhynchos*), Northern Pintails (*Anas acuta*), Greater Scaup (*Aythya marila*), Common Goldeneyes, and Buffleheads being fed grain by an elderly couple. They said that the hybrid had been present for at least two or three weeks and that it usually appeared during their regular noon feeding sessions, and associated with the goldeneyes. The goldeneyes and Buffleheads were diving beneath the large flock of puddle ducks and surfacing at the periphery, but the hybrid bird acted differently, surfacing only for brief moments. When feeding subsided, it surfaced with the goldeneyes. It had the look and behaviour of a goldeneye, intermediate in size, tending toward the larger. Initially it remained with the goldeneyes (males and females), then swam offshore and slept by itself. Afterwards, it approached a small group of Buffleheads, but there was no interaction, and once again it swam off by itself. Its dive posture and flight were goldeneye in character. JKF's impression was that the hybrid was shunned by both sides, although it favoured association with goldeneyes, suggesting that it had been raised as one, in an arrangement like the one JKF had seen 14 years earlier.

FIGURE 1. Hybrid Bufflehead × Common Goldeneye drake showing Common Goldeneye "head toss" courtship display, Esquimalt Lagoon Migratory Bird Sanctuary, 21 March 2009. (Photograph ©Suzanne Huot)

Discussion

This represents the first documented case of interspecific pair-bonding and out-crossing of the Bufflehead with the Common Goldeneye (Johnsgard 1960, 1965; Bellrose 1976; Gauthier 1993; Gillham and Gillham 2002). Hybridization of the Common Goldeneye has been reported with Barrow's Goldeneye, White-winged Scoter (*Melanitta fusca*), Common Merganser (*Mergus merganser*) and Hooded Merganser, and Smew (Johnsgard 1965). Because the Bufflehead and Common Goldeneye occupy similar habitats and the dichromatic patterns of the chicks are nearly identical, one might expect that hybridization of the Bufflehead would occur more often. However, because they are so similar and there is such fierce competition with goldeneyes, one would expect such animosity to suppress mutual attraction. Furthermore, although hybridization occurs much more frequently amongst waterfowl than any other family (Johnsgard 1960; Tubaro and Lijtmaer 2002) and monogamy tends to be the family rule, Mayr (1942) found that hybrids occurred much more rarely among monogamous species. And Buffleheads are strongly monogamous, with a ritualized courtship display very different from that of the Common Goldeneye. So what happens on rare occasions?

Half of the explanation for interspecific attraction could be cross-fostering of Buffleheads by Common Goldeneyes and imprinting of the males. Experiments in cross-fostering in domestic waterfowl show that only the males imprint on the other species (Welty 1975; Randler 2005, 2006). In species in which only the female cares for the young, female imprinting would be counter-productive. Females have an innate preference for the colour patterns, calls, and courtship displays of the male. Thus, although the paternal side of the hybrid is explicable, it remains a mystery how the female goldeneye forsook her own species and fell for the charms of a diminutive (though very dapper) cousin, particularly when she had plenty of her own kind to choose from.

Several years ago, JKF rescued a juvenile male Bufflehead from a predator and kept it over the winter with a white female domestic Call Duck *(Anas*

TABLE 1. Records of Bufflehead hybrids posted on the Internet in the last decade. Not an exhaustive list.

Date observed	Location	Observer	Photo	Comments
Common Goldeneye × Bufflehead				
Monday 1 March 1999	Weber Canyon, Utah	A. Smith	yes	
Tuesday 15 April 2003	Denman Island, B.C.	M. Kirk	no	
Saturday 20 November 2004	Port Alberni, B.C.	M. McRuer	yes	
Monday 29 November 2004	Weber Canyon, Utah	K. Purdy	yes	# documented records to 5
Friday 25 February 2005	Burlington, Ont.	B. Holden	yes	
? April 2005	Ontario	McLaughlin	?	Ontario Birds 23(1)
? February 2007	Laval, Que.	P. Bannon	?	The Song Sparrow 49(4)
Saturday 8 December 2007	Columbia River, Wash.	B. La Framboise	yes	
? March 2008	Walla Walla, Wash.	D. St. George	yes	Returning for last 3 or 4 years
Friday 28 November 2008	Lake Solano, Calif.	G. Ewing	yes	
Wednesday 2 December 2009	Esquimalt, B.C.	?	yes	Same bird as seen in the winter of 2008-09
Friday 1 January 2010	Lake Solano, Calif.	E. Harper	yes	Same bird as seen in 2008
Hooded Merganser × Bufflehead				
Sunday 4 May 1980	Powderhorn Marsh, Ill.	W. Marcisz	yes	Paired with female Bufflehead
Friday 8 December 2006	Berkeley Marina, Calif.	B. Battagin	yes	
Sunday 6 January 2008	Bronte Harbour, Ont.	M. Boyd	no	
Sunday 27 December 2009	Mississauga, Ont.	C. Wood	yes	
Sunday 17 January 2010	Cleveland, Ohio	ammodrammus	yes	
Wednesday 10 March 2010	Central coast, Texas	M. O'Brien	no	

platyrhynchos). They formed a strong pair bond, and although intercourse was not observed, the hen laid and incubated a clutch that proved infertile. When JKF attempted to break up the relationship and release the drake, the Call Duck became distressed and abandoned her clutch. When they were reunited after several days, they greeted each other with evident affection. When JKF released them in the male's natal territory and while he was handling the female, causing distress, the Bufflehead came to her defense, biting his hand and cuffing it with his wings. They remained closely bonded in the wild for a few days; then the female was taken by a predator. It would seem that there is a lot more latitude for individuality in mate choice, not only by the female. This pairing indicated that the "look of love" could bridge a major tribal barrier—Mergini to Anatini.

Hybrids are of special interest to evolutionary biologists (Mayr 1942; Randler 2005, 2008; Tubaro and Lijtmaer 2002), and hybrid waterfowl, because of their striking plumage patterns, are amongst the most studied. Long lists of hybrid waterfowl have been compiled (Gillham and Gillham 2002). Most sightings are from their wintering grounds, and the majority are males. Because waterfowl are widely dispersed and inaccessible in their northern breeding grounds, opportunities to observe the actual parents of hybrids are limited. Therefore, practically all analyses and interpretation of the nature of hybridism are based on the hybrid itself and not the parents. Moreover, attention is focused almost exclusively on male hybrids. This gives a limited understanding, particularly if cross-fostering and sex-specific imprinting are two of the leading factors behind hybridism.

Recent sightings and photographs posted on the Internet

Although JKF was familiar with the scientific literature on the subject and conducted a "Google scholar" search, it wasn't until after he had submitted the first draft of this manuscript that he found several postings about hybrid Buffleheads on the Internet, including one concerning the same bird that SH photographed, in the following winter. Eventually JKF compiled a list of 18 records of Bufflehead hybrids from various Internet sites, such as flickr (**www.flickr.com**, a website used to manage and share photos) and eBird (ebird.org, an online checklist website developed by the Cornell Lab of Ornithology and the National Audubon Society and hosted by Cornell). Most records are from the last few years (Table 1). Two thirds (12) of the records were Common Goldeneye × Buffleheads, including two or three duplicate records. All others were Hooded Merganser × Buffleheads. Except for an apparent female Hooded Merganser × Bufflehead, all other hybrids were males.

In all cases, where it was evident, compared to the Esquimalt bird, the gold eye (subdued) of one species and the pink feet of the other were expressed. The most distinctive variant feature was the shape and extent of the face patch, one of the most distinctive badges of the Mergini tribe. In all cases, where it was apparent, the Common Goldeneye × Bufflehead hybrids were associated with Common Goldeneyes.

In several cases, the hybrids had returned to the same location, year after year, and had become attractions on local birding hotlines. Most of the Common Goldeneye × Buffleheads have been reported from western North America, whereas most of the observations of Hooded Merganser × Buffleheads came from eastern North America. Evidently, hybridism of Buffleheads occurs on a regular but extremely rare basis, and in at least one case—a male Hooded Merganser × Bufflehead hybrid paired with a female Bufflehead—it appears that merganser genes are being passed back into the Bucephala pool.

This exercise attests to the power of the Internet in conjunction with digital photography and the rising popularity of bird watching. There has been an exponential increase in sightings of hybrids that are not being documented as they once were in the scientific literature. With audience fragmentation, the recorded natural history anecdote has become both a victim and beneficiary of the Internet revolution. The large increase in sightings in the last decade compared to all of the previous century is a cultural artifact and not a statistical trend. It demonstrates the power of the Internet to amplify the prevalence of rare phenomena and cautions us about jumping to conclusions regarding the rate of change.

Acknowledgments

My appreciation is extended to the reviewers, A. J. Erskine and C. S. Houston, and my wife, Laura, for their comments. In memory of Buferd and Bella.

Literature Cited

Bellrose, F. C. 1976. Ducks, geese and swans of North America. Second edition. Stackpole Books, Harrisburg, Pennsylvania. 544 pages.

Erskine, A. J. 1972. Buffleheads. Canadian Wildlife Service Monograph Series (4). Information Canada, Ottawa. 240 pages.

Finley, J. K. 2007a. The punctual Bufflehead: autumn arrivals in Shoal Harbour Sanctuary, Vancouver Island in relation to freeze-up. Canadian Field-Naturalist 122: 370-374.

Finley, J. K. 2007b. Offshore flight of Buffleheads (*Bucephala albeola*) after twilight in winter: an anti-predation tactic? Canadian Field-Naturalist 122: 375 – 378.

Gauthier, G. 1993. Bufflehead, *Bucephala albeola*. The Birds of North America no. 67. *Edited by* A. Poole and F. Gill, The Academy of Natural Sciences, Philadelphia. 24 pages.

Gillham E., and **B. Gillham.** 2002. Hybrid ducks. The 5th contribution towards an inventory. Published by the authors, Lydd on Sea, Kent. (unpublished, cited by Randler 2005).

Johnsgard, P. A. 1960. Hybridization in the Anatidae and its taxonomic implications. Condor 62: 25-33.

Johnsgard, P. A. 1965. Handbook of waterfowl behavior. Papers in the Biological Sciences, University of Nebraska, Lincoln.

Mayr, E. 1942. Systematics and the origin of species. Columbia University Press, New York.

Randler, C. 2005. Do forced extrapair copulations and interspecific brood amalgamation facilitate natural hybridization in wildfowl? Behaviour 142: 477-488.

Randler, C. 2006. Behavioural and ecological correlates of natural hybridization in birds. Ibis 148: 459-467.

Randler, C. 2008. Hybrid wildfowl in central Europe—an overview. Waterbirds 31: 143–146.

Tubaro, P. L., and **D. A. Lijtmaer.** 2002. Hybridization patterns and the evolution of reproductive isolation in ducks. Biological Journal of the Linnean Society 77: 193-200.

Welty, J. C. 1975. The life of birds. 2nd edition. W. B. Saunders Co., Philadelphia. 623 pages.

Received 26 March 2009
Accepted 26 May 2010