

The Status of Mottled Duck (*Anas fulvigula*) in Arizona

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Searching Cornell's eBird for "Mexican Duck" (*Anas platyrhynchos diazi*) does not find it. If you enter "Mexican Duck" in the species search box of the online "Birds of North America" (BNA), you won't find it, and you won't be offered Mallard (*A. platyrhynchos*), which is where Mexican Duck is treated as a subspecies, *A. p. diazi*. To be fair, the BNA account of Mallard (Drilling et al. 2002) does contain useful information on Mexican Duck (and a keyword search will find it), and it reflects current, official species-level taxonomic treatment, but it illustrates how far Mexican Duck has slipped below the radar screen of both birdwatchers and ornithologists. And to give some credit, the Christmas Bird Count still does treat Mexican Ducks as a reportable entity. My title is deliberately provocative (Mottled Ducks in Arizona?), but it is more relevant than you might think, as this note will explain. Mexican Duck deserves more attention, and there is growing evidence that treatment as a full species is the best course. In this article "Mallard" refers to the green-headed species, "mallard" to the whole complex of 14 or so species, and "Mexican Duck" to, officially, "Mexican" Duck, *A. p. diazi*.

Mexican Duck occurs from southeastern Arizona, southern New Mexico, and southwestern Texas south through the central highlands of Mexico; at no season is it characteristically a bird of the coastal lagoons. While not migratory in the sense of having entirely separate breeding and wintering ranges, the species certainly shifts locally on a seasonal basis, dispersing with the onset of the summer rainy season to breed in small, often seasonal, wetlands, and congregating at larger bodies of water in drier, winter periods; the length and variability of the dry season may be the critical variables for this species (Williams 1980). The population has been estimated at 55,000 (Williams 1980); winter wildfowl counts in Mexico typically record 15,000 to 20,000 birds, exceptionally 49,000. Although subject to substantial fluctuations, the overall population trend is stable to increasing (Pérez-Arteaga et al. 2002). This is encouraging, given that the populations in the U.S. (particularly) and Mexico were thought to be heading toward the endangered level (Aldrich and Baer 1970).

Mexican Duck was treated as a full species in the American Ornithologists' Union Check-list of 1957 (5th ed.), but it was included in Mallard by 1983 (6th ed.) based on "extensive hybridization in southeastern Arizona, southern New Mexico, and west-central Texas" that "compels merger into a single species (Hubbard 1977)" (A.O.U. 1998).

Since the lump with Mallard, studies of duck genetics have revealed much about the evolution of the Mallard group, although substantial questions remain about some aspects. With regard to Mexican Duck, however, the picture has been clear and consistent in three separate studies (Johnson and Sorenson 1999, McCracken et al. 2001, and Kulikova et al. 2004): The closest relative of Mexican Duck is *not* Mallard, rather, it is Mottled Duck, the closest relative of these two is American Black Duck (*A. rubripes*), all of which are in turn related to the Spot-billed Duck group (*A. poecilorhynchos/zonorhynchos*) (see also Livezey 1991).

Everyone is comfortable with the generality of a mallard in size, shape, and quacks and whistles. The white ones in parks are not a puzzle, and the various species around the world without green heads are still familiar. The evolutionary trees in these studies show a group of "monochromatic mallards" (the current and perhaps more neutral phrase than the oft-used "hen-plumaged mallards") that includes Mexican, Mottled, and American Black, a group recognized by earlier taxonomists such as Hellmayr and Conover (1948) and Palmer (1976). Analysis of avian genetic material is increasingly revealing relationships that cannot be deduced easily from field or external characters, and the recent studies of mallard genetics have not been focused specifically on Mexican Duck, but more on the evolution of the green-headed and monochromatic groups. The desire is to create an accurate evolutionary tree for the mallards that will reveal the branchings between and within the monochromatic and green-headed lineages. So far the interpretation is that the ancestral mallard was monochromatic, but the situation is very complicated and probably involves a pinch of incomplete lineage sorting and multiple dashes of invasion, hybridization, and introgression, requiring studies with bigger samples and more taxa.

As an illustrative aside, consider the recent (re-)split of Green-winged Teal (*A. carolinensis*) from Common Teal (*A. crecca*). In part, this decision was based on a genetic study that showed that Common and Green-winged Teal were not each other's closest relatives (Johnson and Sorenson 1999). The closest relative of Green-winged Teal is Speckled Teal (*A. flavirostris*), a monochromatic teal of South America (and if you want to stretch your brain further, why are so many waterfowl of tropical latitudes and in the Southern Hemisphere monochromatic and/or "dull"?). The genetic distance between Common and Green-winged Teal is comparable to that between Mallard and Northern Pintail (*A. acuta*), hence great. All of this contributes to the increasing realization that in waterfowl some plumage similarities represent tremendous plumage conservatism over time while outstanding plumage differences may be more recent

changes.

And as a further aside, in terms of green-headed Mallards, the green-headed Mallards of North America primarily share certain genetic material with the monochromatic mallards and evidence “substantial genetic structure between Old World and New World” (Kulikova et al. 2004, 2005). Don’t expect a split of Mallard soon, but it is an interesting situation, and complicated. And don’t expect a split of Mottled Duck soon, although the eastern and western populations evidence “an enduring geographic split” (McCracken et al. 2001).

Returning to Mexican Duck, the current situation is that it is lumped with a species, Mallard, which is not its closest relative, while its closest relatives (progressively, Mottled, American Black, and [E.]Spot-billed) are split from Mallard. This is not a consistent position. One way of addressing it would be to lump all 14 mallards, monochromatic and dichromatic. Another would be to remove Mexican Duck from Mallard and lump it with Mottled, Mexican’s closest relative. That adds Mottled Duck to the Arizona list and cleans up the inconsistency of lumping Mexican with Mallard. And it makes my title look prophetic, but it strikes me as inconsistent with current taxonomic trends that tend to accord specific status to populations that show genetic distance, morphological distinctions, and differences in ecology. Simply, we are looking at different ducks living different lives on the coastal plain of the Gulf Coast (Mottled) and the interior plateaus of Mexico and the Southwestern U.S. (Mexican). Williams (1980) urged consistency, one of the recent studies recommended that Mottled and Mexican “be designated as species so that the nomenclature is consistent with phylogeny” (McCracken et al. 2001), while the other recent studies simply treat it in a matter-of-fact way as a separate species, *Anas diazi*.

That Mexican Ducks and Mallards hybridize is certainly relevant, but hybridization is increasingly not regarded as outcome determinative. Hybrids are known among over 10% of the bird species on earth (Grant and Grant 1992). Hybridization occurs between (green-headed) Mallard and virtually every monomorphic mallard species, whether naturally in the wild or from introduced populations (for examples, see Kulikova et al. 2004). Hybridization does indicate some level of shared ancestry, but not necessarily that hybridizing populations are conspecific or even an especially close relationship (consider all the inter-generic hybrids in birds, including waterfowl and warblers).

My guess is that in Arizona we are dealing with two general issues. First, Mexican Duck is a variable bird that looks like a Mallard to start with because both share a mallard ancestor and it further shows some Mallard characters because there have been periods of hybridization between the two. For instance, part of the problem with which many researchers (most recently Kulikova et al. 2004, 2005) have struggled is that New World Mallards share haplotypes with the monochromatic mallards that Old World Mallards do not possess; periods of hybridization between New World Mallards and New World monochromatic mallards in past millennia would seem to be part of the explanation. Second, there will be ongoing hybridization between pure or relatively pure birds as a result of contact when pair bonds are being formed.

My recent experience in eastern Cochise County and environs is not of the “extensive” hybridization that influenced the decision to lump the two. Rather, it is of no obvious hybridization, because I have not seen an obvious Mallard during the breeding season in the areas I bird, areas in which Mexican Ducks breed at a number of localities in small to moderate numbers. Inspection of the range maps in the *Arizona Breeding Bird Atlas* (Corman and Wise-Gervais 2005) suggests limited opportunities for hybridization (indeed, I can find no overlap of “confirmed” blocks, although there is overlap of “confirmed” with “probable” squares). Brown (1985) found that “there is a marked tendency to maintain racial fidelity” and that hybridization is limited (there is no hybrid swarm). Monson and Philips (1981) state that the extent of hybridization is “unknown.” Hybrids may be more numerous in parts of New Mexico and western Texas, but I am unaware of recent, published material on this subject. A 1984 study found no morphological evidence of an ongoing, southward spread of Mallard characters, and, while finding clinal variation from north to south in Mexico (from more to less Mallard like), concluded that “large, genetically uniform populations” of Mexican Ducks occur in many areas of Mexico, including northwestern Chihuahua (Scott and Reynolds 1984).

Of course part of my problem is distinguishing a hybrid. I’m not sure how one would tell, for instance, a second or third generation recent hybrid from a variable northern Mexican Duck. On the basis of the scoring system of Hubbard (1977) and Scott and Reynolds (1984), which evaluates 18 characters, the only pure Mexican Ducks, scoring 36 points, are at the southern edge of the range in Central Mexico, and even that population averages only a 34.5. Birds from northwestern Chihuahua score 26, and others from the New Mexico/Texas border less (a pure Mallard scores 0). Thus, what looks to me typical of Mexican Duck and probably is Mexican Duck will not score close to a perfect 36. So it is not surprising that one observer has seen few “pure” males in Arizona (Taylor 2005). (For a comparison, how many streaks on the flanks of an otherwise typical Hermit Warbler are “too many” and how do you treat a Red-naped Sapsucker that looks fine except for its small, pink nape?) I am suggesting that Mexican Duck is a valid species but that its identification will often not be a comfortable situation (OK, often an ugly situation) because of the “background

noise” of Mallard characters in the plumage of Mexican Duck. We have learned to live with background noise in flickers, buntings, orioles, and, in particular, American Black Duck, and I am sure that we can live with it in Mexican Duck as well.

Another question could be: “Of what consequence is that hybridization?” The answer must involve the fact that currently no native green-headed Mallards are breeding in the areas of Mexico in which the vast preponderance of Mexican Ducks breed. Although there had been fears that Mallard was going to swamp Mexican Duck, Scott and Reynolds found no evidence of the “hybrid zone” shifting south. Finally, how “natural” is the hybridization? What part of the hybridization represents breeding of Mallards established as a result of man’s activities in the original range of Mexican Ducks or (re-) introduction of Mexican Ducks in areas that now have Mallards? Recent hybridization of American Black Ducks with Mallards is attributed to human alterations of northeastern North America, including introductions of Mallards; that fact is one that influenced the A.O.U. Check-list Committee to maintain the specific status of American Black Duck (A.O.U. 1998).

Behind the issue of hybridization are some interesting aspects of biology. In general, in ducks the pair bonds are formed yearly on the wintering grounds, and this is true of Mallards (Drilling et al. 2002). Further, ducks differ from most groups of birds in that breeding philopatry (faithfulness as a breeder to the natal location) is “female based,” meaning that when a pair bond is formed on the wintering grounds, often involving birds from different regions, the male will return with the female to breed at the female’s natal area. The number of Mallards wintering in the range of Mexican Ducks is not huge, and that number is decreasing, as Mallards have been short-stopped by improving feeding conditions in the U.S. (Scott and Reynolds 1984, Pérez-Arteaga et al. 2002). Also, it has been suggested (Brown 1985, Corman 2005) that pair formation in Mexican Ducks may occur before that of Mallards, thus decreasing the likelihood of mixed pairs (most migratory northern Mallards are relatively late arrivals in fall, potentially arriving after pair formation by most Mexican Ducks, but this does not exclude the possibility of Mexican Ducks hooking up with golf course pond Mallards). Williams (1980) noted that pairs were present in the population at all seasons, and detected other suggestions of a strong pair bond. Brown (1985) further wonders if most adult Mexican Ducks re-pair, which would decrease the likelihood of hybridization. We have much to learn to see if hybridization is a continuing, major issue in Arizona or anywhere else.

Finally, it may be a good idea to deal with birder scuttlebutt, which over the last few decades has included this facet: A reluctance on the part of some to advocate splitting Mexican Duck from Mallard stems from a concern about how a split could create a de facto threatened species in the U.S. (it was listed from 1967 to 1978, then de-listed, in part on the perception that it was a much-hybridizing subspecies), especially a concern about how that could affect the popular sport of duck hunting. As “Cactus” Ferruginous Pygmy-Owl slips through our fingers, I don’t wish to trivialize the importance of preserving the U.S. populations of taxa that are more common elsewhere, but the fact remains that after over 25 years of unprotected status as a subspecies of Mallard (although the ESA can protect populations, species are higher profile), Mexican Ducks are still here, and the species has shown positive trends in Mexico (Pérez-Arteaga et al. 2002, 2005), where well over 90% of the population occurs (98%: Williams 1980). If you will forgive me for some perverse humor, you couldn’t imagine the stock tanks of Cochise County being declared critical habitat, could you?

I expect that eventually Mexican Duck will be split officially from Mallard. The A.O.U. Check-list Committee may not jump on the recent studies. It may reasonably seek further information (e.g. on hybridization) and further studies of what is a very complicated group (e.g., what is the relationship between Mexican Duck and the two groups of genetically isolated Mottled Ducks?); we all dislike the back-and-forth of many past decisions, even though all the decisions seemed reasonable at the time (e.g., Northern Oriole). And where should we, ornithologists in the field in Arizona, go from here? I think we should study Mexican Duck as though it will be split. First, we could benefit from some brave volunteer providing this journal with an article about identifying these ducks, and their hybrids. Second, we should all keep track of Mexican Ducks and Mallards, most particularly of breeding birds and any hybrids (or even situations in which hybrids might occur). Third, we should carefully note the timing of arrivals and departures of both Mallards and Mexican Ducks, and their numbers. Finally, residents of this region should anticipate a growing interest from visitors in seeing Mexican Ducks, and develop better information about their haunts.

ACKNOWLEDGMENTS

Sandy Williams provided reference materials and informal discussion on the bird’s biology in Mexico; Rod Drewien furnished information on historical and current census efforts; and Louis Bevier and Rose Ann Rowlett made helpful comments on earlier drafts.

LITERATURE CITED

- Aldrich, John W. and Kenard P. Baer. 1970. Status and Speciation in the Mexican Duck (*Anas diazi*). *Wilson Bull.* 82(1): 63-73.
- American Ornithologists' Union. 1998. Check-list of North American Birds. 7th edition. American Ornithologists' Union, Washington, D.C.
- Brown, David E. 1985. Arizona Wetlands and Waterfowl. Univ. Arizona Press, Tucson.
- Corman, Troy E. 2005. Mallard. In Corman, Troy E. and Cathryn Wise-Gervais, eds. 2005. Arizona Breeding Bird Atlas. Univ. New Mexico Press, Albuquerque.
- Corman, Troy E. and Cathryn Wise-Gervais, eds. 2005. Arizona Breeding Bird Atlas. Univ. New Mexico Press, Albuquerque.
- Drilling, Nancy, Rodger Titman, and Frank McKinney. 2002. Mallard (*Anas platyrhynchos*). *The Birds of North America Online* (A. Poole, Ed.) Ithaca: Cornell Laboratory of Ornithology; Retrieved from The Birds of North American Online database: <http://bna.birds.cornell.edu/>
- Grant, P. R. and B. R. Grant. 1992. Hybridization of Bird Species. *Science* 256: 193-197.
- Hellmayr, Charles E. and Boardman Conover. 1948. Catalogue of Birds of the Americas and Adjacent Islands. Pt. I., No. 2. Field Museum Zoological Series, Vol. XIII.
- Hubbard, J. P. 1977. The biological and taxonomic status of the Mexican Duck. N.M. Dept. Game and Fish Bull. 16: 1-56.
- Johnson, Kevin P. and Michael D. Sorenson. 1999. Phylogeny and Biogeography of Dabbling Ducks (Genus: *Anas*): A Comparison of Molecular and Morphological Evidence. *Auk* 116(3): 792-805.
- Kulikova, Irina V., Yury N. Zhuravlev, and Kevin G. McCracken. 2004. Asymmetric hybridization and sex-biased gene flow between Eastern Spot-billed Ducks (*Anas zonorhyncha*) and Mallards (*A. platyrhynchos*) in the Russian Far East. *Auk* 121(3): 930-949.
- Kulikova, Irina V. et al. 2005. Phylogeography of the Mallard (*Anas platyrhynchos*): Hybridization, Dispersal, and Lineage Sorting Contribute to Complex Geographic Structure. *Auk* 122(3): 949-965.
- Livezey, B. C. 1991. A phylogenetic analysis and classification of recent dabbling ducks (tribe Anatini) based on comparative morphology. *Auk* 108(3): 471-508.
- McCracken, Kevin G., William P. Johnson, and Frederick H. Sheldon. 2001. Molecular population genetics, phylogeography, and conservation biology of the mottled duck (*Anas fulvigula*). *Conservation Genetics* 2: 87-102.
- Monson, Gale and Allan R. Phillips. 1981. Annotated Checklist of the Birds of Arizona (2nd Ed.). University of Arizona Press, Tucson.
- Palmer, Ralph S. 1976. Handbook of North American Birds. Vol. 2, Pt. 1. Yale Univ. Press, New Haven.
- Pérez-Arteaga, Alejandro, Kevin J. Gaston, and Melanie Kershaw. 2002. Population trends and priority conservation sites for Mexican Duck *Anas diazi*. *Bird Conserv. Int.* 12(1): 35-52.
- Pérez-Arteaga, A. et al. 2005. Priority sites for wildfowl conservation in Mexico. *Animal Conservation* 8: 41-50.
- Scott, Norman J., Jr., and Robert P. Reynolds. 1984. Phenotypic Variation of the Mexican Duck (*Anas platyrhynchos diazi*) in Mexico. *Condor* 86(3): 266-274.
- Taylor, Richard Cachor. 2005. A Birder's Guide to Southeastern Arizona. American Birding Association, Colorado Springs, CO.
- Williams, S. O. III. 1980. The Mexican Duck in Mexico: Natural History, Distribution, and Population Status. Ph.D. Thesis, Colorado State Univ., Fort Collins.