

Cattle egret predation causing reproductive failures of nesting tricolored blackbirds

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The cattle egret (*Bubulcus ibis*) is a medium-sized Old World wading bird that recently has become well established in western North America (Crosby 1972, Telfair 2006). The diet of the cattle egret consists primarily of large insects and other invertebrates (Mora 1992, Telfair 2006), with frogs and fishes taken opportunistically during periods of enhanced prey availability (Sodhi 1989, Maddock 1995). In rare cases, exhausted migratory passerine birds have been taken (Cunningham 1965, Myers and Wallace 2003). This note reports the consumption of nestling tricolored blackbirds (*Agelaius tricolor*) by cattle egrets and documents the first known widespread and sustained consumption of birds by cattle egrets. Since 2006, when predation by cattle egrets upon tricolored blackbird nestlings was first noted, the number of cattle egrets observed to prey upon tricolored blackbird nestlings has increased and is believed to have caused the complete, or near-complete, reproductive failures of even large (ca. 80,000 breeding birds) breeding colonies.

The tricolored blackbird, also referred to as the tricolor, is a California near-endemic songbird and close relative of the widespread and abundant red-winged blackbird (*Agelaius phoeniceus*). The tricolor nests in colonies consisting of tens to tens of thousands of individuals, primarily in the Central Valley of California (Beedy and Hamilton 1999). I have been studying tricolor breeding colonies since 2005, with an emphasis on colonies in the Central Valley, in an attempt to: (1) detect all of the largest breeding colonies; (2) conserve at-risk colonies; and, (3) estimate the reproductive success of the largest colonies (see Meese 2010, 2011 for descriptions of field methods and summaries of these efforts).

In April 2006, while monitoring a tricolor breeding colony adjacent to a dairy in Tulare County, I observed cattle egrets apparently preying upon tricolor nestlings. With the permission of the landowner, I and a U.S. Fish and Wildlife Service biologist from Kern National Wildlife Refuge entered the colony and observed a foraging flock of 18 cattle egrets removing and consuming young (less than 5-days-old) tricolors from nests constructed in mallow (*Malva* spp.) that had infested a field of triticale (a hybrid grain grown to feed dairy cattle). I again observed cattle egrets preying upon tricolor nestlings at this site on two subsequent visits within a 10-day interval, but was unable to quantify the effects of cattle egret predation on tricolor reproductive success due to the harvest of the triticale nesting substrate prior to the fledging of the nestling tricolors.

Subsequent annual monitoring of Central Valley tricolored blackbird colonies has documented continuing predation by an increasing number of cattle egrets on tricolor colonies in Tulare County (Table 1). The persistent predation by cattle egrets upon tricolored blackbird nestlings is of potentially great conservation concern, as the abundance of tricolors has recently been declining rapidly (Kyle and Kelsey 2011). The relatively great losses inflicted by foraging cattle egrets are a now serious constraint on tricolor reproduction in some of the largest breeding colonies (Kyle and Kelsey 2011) and, although apparently unknown as tricolor predators until 2006, predation by cattle egrets is believed responsible for the complete reproductive failures of even very large tricolor breeding colonies.

TABLE 1.—Characteristics and impacts of cattle egret predation upon tricolored blackbird colonies in Tulare County, California, 2006-2011.

Year	Number of tricolor colonies affected	Estimated number of nesting tricolors	Maximum number of cattle egrets observed	Number of tricolor fledglings observed
2006	1	60,000	20	
2007	1	16,120	100	2,000
2008	1	80,000	75	5,000
2009	2	80,000	40	200-300
2010	3 ^a	40,000 ^a	80 ^a	0 ^a
2011	1	22,500	225 ^a	0

^aScott Frazer, USFWS, personal communication

The cattle egrets, all of which appear to be breeding at a single rookery located 5-15 km south-southwest of the affected tricolor colonies in Tulare County, concentrate their foraging on one tricolor colony at a time but, after eliminating the contents of the tricolor nests at one colony, may then move on to prey upon the nestlings in additional colonies. Persistent cattle egret predation has inflicted heavy losses on some of the largest and potentially most productive tricolor breeding colonies and may help to explain the recent 35% reduction in abundance of tricolors statewide (Kyle and Kelsey 2011).

Predation by cattle egrets upon tricolor nestlings appears to have arisen spontaneously in 2006, as previous investigators who had conducted intensive surveys of breeding tricolors did not report such predation. Beedy and Hamilton (1999) did not list cattle egrets among tricolor predators, and predation upon birds by cattle egrets is rarely reported (Telfair 2006). I did not observe cattle egrets in tricolored blackbird colonies in 2005, nor did I observe cattle egrets in any other tricolor colony in 2006.

Given the increasing impacts of cattle egret predation and the decline in tricolor abundance, the foraging behavior of cattle egret populations near tricolor colonies must be closely monitored and include observations of tricolor colonies outside Tulare County. It may already be appropriate to consider plans to reduce the impacts of cattle egret predation, although efforts to eliminate heron or egret rookeries elsewhere have proven problematic (Grant and Watson 1995). Should tricolor numbers continue to decline and impacts due to cattle egret predation continue to increase, a resolution to the tricolored blackbird-cattle egret conflict could become an essential component of tricolor conservation efforts.

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LITERATURE CITED

- BEEDEY, E. C., AND W. J. HAMILTON III. 1999. Tricolored blackbird (*Agelaius tricolor*). In A. Poole and F. Gill, editors. The Birds of North America, No. 423. Academy of Natural Sciences, Philadelphia, Pennsylvania and American Ornithologists Union, Washington, DC, USA.
- CROSBY, G. T. 1972. Spread of the cattle egret in the Western Hemisphere. *Bird-banding* 43:205-212.
- CUNNINGHAM, R. L. 1965. Predation on birds by the cattle egret. *Auk* 82:502-503.
- GRANT, K. R., AND J. WATSON. 1995. Controlling nuisance egret and heron rookeries in Oklahoma. *Great Plains Wildlife Damage Control Workshop Proceedings* 12:32-33.
- HAMILTON, W. J. III, AND R. J. MEESE. 2006. Habitat and population characteristics of tricolored blackbird colonies in California. Report submitted to the California Department of Fish and Game, Sacramento, USA. Available at: <<http://tricolor.ice.ucdavis.edu/reports>> [Accessed 10 March 2012].
- KYLE, K., AND R. KELSEY. 2011. Results of the 2011 tricolored blackbird statewide survey. Report submitted to Audubon California, Sacramento, USA. Available at: <<http://tricolor.ice.ucdavis.edu/reports>> [Accessed 10 March 2012].
- MADDOCK, M. 1995. Response of cattle egrets to flood. *Australian Birds* 29:1-9.
- MEESE, R. J. 2006. Settlement and breeding colony characteristics of tricolored blackbirds in 2006 in the Central Valley of California. Report submitted to the U.S. Fish & Wildlife Service, Sacramento, California and to Audubon California, Emeryville, USA. Available at: <<http://tricolor.ice.ucdavis.edu/reports>> [Accessed 10 March 2012].
- MEESE, R. J. 2011. Reproductive success of tricolored blackbird colonies in 2011 in the Central Valley of California. Nongame Wildlife Program Report 2011-08. California Department of Fish and Game, Sacramento, USA. Available at: <<http://tricolor.ice.ucdavis.edu/reports>> [Accessed 10 March 2012].
- MORA, M. A. 1992. Habitat use by foraging cattle egrets in the Mexicali Valley, Baja California. *Wilson Bulletin* 104:142-148.
- MYERS, B. M., AND P. A. WALLACE. 2003. Central southern region (spring migration). *North American Birds* 57:359-361.
- SODHI, N. S. 1989. Monthly variations in the diet of the cattle egret (*Bubulcus ibis*) in and around Chandigarh. *Journal of the Bombay Natural History Society* 86:440-443.

TELFAIR II, R. C. 2006. Cattle egret (*Bubulcus ibis*). In A. Poole, editor. The birds of North America online. Cornell Laboratory of Ornithology, Ithaca, New York, USA. Available at: <<http://bna.birds.cornell.edu/bna/species/113>> [Accessed 10 March 2012].

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