In Memoriam: Thomas W. Custer 1945-2018

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Tom Custer weighing heron chick in Lavaca Bay, Texas.

Thomas W. Custer passed away at his home on 12 October 2018 in Brownsville, Minnesota at the age of 73. Tom was born in Cokato, Minnesota on 18 August 1945. He spent his youth in Downey, in Southern California. After high school, he received his B.A. in Biology in 1969 and a M.A. in Zoology in 1971, both from California State University, Fullerton. He went on to get his Ph.D. in 1974 from the University of California, Berkeley in Zoology/Ecology, in Frank Pitelka's lab.

Tom's first professional job was with the U.S. Department of the Interior, Fish and Wildlife Service, at the Patuxent Wildlife Research Center, Laurel, Maryland, where he worked as a Research Zoologist from 1974-1983. While there, in 1975, he invited Don McCrimmon (who was completing his dissertation at North Carolina State), to give a seminar on his heron nesting ecology research. That provided Don's first exposure to the broader professional world and the beginning of a long collaboration with Tom. Tom next worked as Leader in the Gulf Coast Research Group from 1983-1991 in Victoria, Texas. In 1991, Tom moved to the upper Midwest, to take a job at what is now the U.S. Department of the Interior, Geologic Survey, Upper Midwest Environmental Sciences Center in La Crosse, Wisconsin. He remained a research scientist with this agency for the rest of his life, as many in his cohort did. Tom's research here was impor-

tant to the knowledge and stewardship of our environment.

Tom received a number of awards, including as a graduate student in 1969, when Tom was awarded the Frances F. Roberts Award for best paper presented at the Cooper Ornithological Society. He became an Elective Member of the American Ornithologists' Union in 1980 and was elected a Fellow Member in 1995. He joined the Editorial Boards of *Environmental Pollution* and *Environmental Toxicology and Chemistry* in 1998. He was a founding member, and active for his entire career, in the Colonial Waterbird Group (now the Waterbird Society).

His career spanned more than four decades and was highly productive with the publication of more than 135 scientific papers. He worked until his death as a biologist, because that is what he loved to do. His passion was to collect and analyze data and then publish those findings. For his dissertation, he studied the energetics of Lapland Longspurs (*Calcarius lapponicus*) near Barrow, Alaska (Custer and Pitelka 1977). His later research focused primarily on the effects of contaminants on bird populations. He worked mostly on aquatic birds, such as Great Blue Herons (*Ardea herodias*) (Custer *et al.* 2010), as well many other heron and egret species, terns and waterfowl. More recently, he used Tree Swallows (*Tachycineta bicolor*) to understand the effects of environment contaminants on birds (Custer *et al.* 2012), from the molecular level up through population-level effects. He also worked on declining moose (*Alces alces*) populations in northwestern Minnesota and even worked on lizard species in New Mexico.

He investigated an eclectic mix of contaminants including PCBs, dioxins and furans, and trace metals such as mercury and lead, but he was more recently delving into the effects of many of the newer contaminants, such as the brominated flame retardants, perfluorinated chemicals and pharmaceuticals and personal care products. A recent bioindicator paper shows how Tom was always making successful collaborations that moved science forward, with research covering 7-8 years of science on the Great Lakes Restoration Initiative (GLRI) (Custer *et al.* 2017). The results of a recent paper (Custer *et al.* 1999) that DDE, not PCBs, was the primary driver in decreased reproductive success in Double-crested Cormorants (*Phalacrocorax auritus*), challenged a number of previous findings. As time went by and others started to re-look at the role of DDE in avian reproduction, these conclusions were validated. Tom was a true scientist.

Walt Koenig (UC-Berkeley and Cornell) remembers Tom working hard at Barrow, Alaska (where he'd worked for quite a few years at that point and was completing his last field season) but then, acting strangely amused, he abruptly informed the field staff that he was leaving the next day to head back to Berkeley. Walt's recollection is that literally the day he left the mosquitoes came out in force, rendering field-work a lot less pleasant than it had been up to that time. As Tom used to say in his talks, there were so many mosquitoes at Barrow that not only the birds but people could easily ingest enough of them to survive if you tried, and maybe even if you didn't.

Tom was fundamental to the formation of the Waterbird Society and the journal *Waterbirds* (then called *Colonial Waterbirds*). At a meeting in September 1975, wading bird biologists in Patuxent Wildlife Research Center, Laurel, Maryland formulated the idea of a wading bird conference and organization to facilitate communication and research on long-legged waterbirds. The Steering Committee that then formed included Mitchell Bird, Tom Custer, Kirke King, Don McCrimmon, Doug Mock, John Ogden, Sandy Sprunt and Don Woodard. In 1976, the North American Wading Bird Conference was held in Charleston, South Carolina 14-17 October 1976, in conjunction with another group working on the same idea from Massachusetts Audubon. At this meeting, the Colonial Waterbird Group was formally established with input from both groups who had previously been organizing independently. The first publication of the Waterbird Society and the *Colonial Waterbirds* journal resulted. Tom was always an organizer and collaborator, but then tended to stay in the background.

The program at the South Carolina meeting was all about long-legged waterbirds, the inclusion of short-legged colonial waterbird papers were included on the program by the next meeting. Further expansions of the Waterbird Society's membership included the addition of scientists working on non-colonial waterbirds, notably shorebirds, and then waterfowl. The latest species group added were the aquatic passerines.

He is survived by Christine, his wife and research partner of 30 years; his brother and sister-in-law, LeRoy and Suzanne Custer of Annandale, Minnesota and several nieces and nephews and their children.

Tom had a wonderful sense of humor, a friendly and unpretentious nature, and an unwaveringly professional approach to science. Tom was an outstanding scientist and person, whose work and love of science will be greatly missed. His legacy will continue to inspire the work of others and will continue to promote the conservation of waterbirds worldwide.

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