



## **An Alternative Hypothesis for the Cause of the Ivory-billed Woodpecker's Decline**

Source: The Condor, 110(4) : 808-810

Published By: American Ornithological Society

URL: <https://doi.org/10.1525/cond.2008.8658>

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## BOOK REVIEWS

*The Condor* 110(4):808–810  
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**An Alternative Hypothesis for the Cause of the Ivory-billed Woodpecker's Decline.**—Noel F. Snyder. 2007. Monograph of the Western Foundation of Vertebrate Zoology, Camarillo, CA. 58 pp., ISSN 0511-7550. \$25.00 (paper).

It is human nature to want simple answers to complex questions. If the easy answer also carries a broader message, then it becomes nearly irresistible. The correctness of the answer can become completely secondary to the heuristic power of the argument and the lesson that is being taught.

Why did Ivory-billed Woodpeckers (*Campephilus principalis*) disappear from North American forests in the early 20<sup>th</sup> century? The simple answer is that when the virgin forests on which the species depended were cut, these foraging specialists could not survive in the remaining second-growth forests and simply faded away. It's a good story, first told and expounded by James Tanner (1942), the foremost expert on these magnificent woodpeckers, who drew on his personal observations of ivorybills in Louisiana. It is a simple story—the huge woodpecker with a huge bill needed huge trees. And it is a story that carries a critical conservation message—wanton destruction of native habitats inevitably leads to the extinction of species. This explanation for the demise of the ivorybill is so powerful that it stands virtually unchallenged from sixth-grade classrooms to the lecture halls of our most distinguished universities. Unfortunately, this explanation is at best incomplete and at worst totally inaccurate.

In a methodical reassessment of the evidence, Snyder attempts to dismantle the argument that the cutting of virgin forest was the primary cause of the disappearance of the Ivory-billed Woodpecker. His alternative explanation is that the Ivory-billed Woodpecker disappeared in the late 19<sup>th</sup> and early 20<sup>th</sup> century primarily due to direct persecution by people. Put simply, Snyder contends that people shot virtually every Ivory-billed Woodpecker on the continent.

Snyder develops his thesis on four fronts: (1) ivorybills are not foraging specialists, (2) ivorybills were, until the late nineteenth century, common rather than rare birds within their habitat, (3) ivorybills declined in and disappeared from many regions before virgin forests were cut, and (4) ivorybills were shot not simply by skin collectors but also much more extensively for food and sport. These four arguments converge on the central argument that there is substantial evidence that Ivory-billed Woodpeckers were shot to near extinction. Snyder includes assessments of Cuban as well as U.S. populations of ivorybills, but given recent analyses showing that Cuban birds are genetically distinct from U.S. birds (Fleischer et al. 2006), I'll focus this review on the portion of the book dealing with U.S. ivorybills.

The argument against foraging specialization may be the argument that ivorybill enthusiasts will find most difficult to accept because it challenges one of the primary theses of the Ivory-billed Woodpecker Bible—James Tanner's 1942 monograph

*The Ivory-billed Woodpecker*. Following an observation apparently first made by Arthur Allen, Tanner's graduate mentor, Tanner noted that Ivory-billed Woodpeckers scaled thick, tightly adhering bark from large, recently deceased trees to get large beetle larvae, a feeding adaptation that is unique among North American woodpeckers. Tanner concluded that a majority of the food intake of ivorybills came through this foraging mode and hence, that an abundance of large, recently killed trees was essential for the persistence of ivorybills.

Snyder does not challenge the idea that Ivory-billed Woodpeckers scale bark to get beetle larvae; he takes issue with the contention that bark scaling is the primary means by which ivorybills procure food and that this foraging specialization ties the species to tracts of virgin forest. According to Snyder, Tanner's assertion of feeding specialization came from his observations made at one season of the year of primarily two individual ivorybills in a single section of the Singer Tract, the Arkansas forest where Tanner conducted the only detailed study of the species. Snyder contends that these observations are not representative of the species overall, and instead, he looked to the stomach contents of collected birds. As has been previously documented by Tanner (1942) and Jackson (2006), the stomach contents of 10 Ivory-billed Woodpeckers are described in the literature, and the majority of food items in this diet analysis are plant material such as nuts and fruits—hardly the sort of food that is pulled from beneath slabs of bark in virgin forests. These stomach analyses suggest a diverse diet, but Snyder acknowledges that observations from the stomach contents of 10 birds represent a meager snapshot on which to characterize the feeding habits of a species.

Snyder adds no new information about the diets of Ivory-billed Woodpeckers. He simply put an emphasis on stomach contents from birds collected outside the breeding season rather than Tanner's observations of food consumed during the breeding season. Many species of birds, however, rely on foraging specializations primarily during crunch times, such as during the breeding season. At other times of the year, when there is an abundance of a variety of foods, the same birds might become foraging generalists. In ivorybill terms, without specialized bills and foraging behaviors concentrated in mature forests with dead trees, Ivory-billed Woodpeckers might have a tough time raising young. This was Tanner's contention, and Snyder does not convincingly overturn this assertion. Degree of foraging specialization is an important aspect of ivorybill life history because, despite the limited observations on which it is based, Tanner's assertion that ivorybills can persist only in fully mature forests with abundant recently killed trees has shaped the perceptions of all subsequent ivorybill searchers, including the leaders of recent search efforts in the Big Woods in Arkansas and along the Choctawhatchee River in Florida, and the multistate searches by the Cornell Lab of Ornithology Mobile Search team.

The second of Snyder's points focuses on the historic density of Ivory-billed Woodpeckers. In his monograph, Tanner (1942) asserted that each pair of ivorybills needed from 6 to 17 square miles of fully mature bottomland forest. Tanner based the one-pair-per-seventeen-square-mile estimate on his own studies in the Singer Tract and the one-pair-per-six-square-mile estimate on an anecdote in which all the ivorybills were shot and hence counted from a single swamp in Florida. Snyder argues that, by the time these estimates were made (the early 20<sup>th</sup> century), ivorybills were already greatly reduced in numbers and that, historically, ivorybills were substantially more abundant than these estimates suggest. If Snyder had stopped with the general assertion that Ivory-billed Woodpecker may have once been more abundant than the 20<sup>th</sup> century estimates suggest, the point would have been properly made. But Snyder pushes forward and, in my opinion, tries to infer too much about Ivory-billed Woodpecker abundance in the nineteenth century from too little information. Working from a handful of vague verbal descriptions, Snyder tries to quantify what "abundant" or "very common" meant in terms of actual density of birds. I found this part of his monograph unconvincing in its attempt to put numbers to vague descriptions of abundance. Moreover, in my opinion, Snyder is selective in his review of abundance estimates of ivorybills in the 19<sup>th</sup> century. I have not personally waded through these historical records, but Jackson (2006) did, and his account includes more statements regarding the scarcity of ivorybills than appear in Snyder's monograph. Overall, I think Snyder is probably correct that the verbal descriptions of early naturalists suggest that ivorybills once existed at a greater density than the early-20<sup>th</sup>-century estimates of Tanner indicate. To suggest that ivorybills may have once been as common as Pileated Woodpeckers does not seem warranted to me.

Snyder's third argument is that Ivory-billed Woodpeckers declined and disappeared in many areas before these areas were logged. Tanner (1942) reported what he thought was a strong correlation between date of logging and disappearance of Ivory-billed Woodpecker populations throughout the southeastern U.S. Tanner's assessment was made in an age before statistics were commonly applied to this sort of problem, and Tanner never even plotted the estimated cutting and extirpation dates. Snyder is no more quantitative than Tanner in his reassessment of Tanner's assertion. Working from rangewide assessments, Snyder states that in the Southeastern U.S., ivorybills declined or were locally extirpated before the turn of the 20<sup>th</sup> century, which was before forests were cut in many areas. With the exception of the Singer Tract, however, Snyder cites not a single specific location where trees persisted but ivorybills did not. This critical argument would have been made much more effectively if Snyder had pointed to at least a few specific areas (like the Apalachicola region of Florida or the Santee region of South Carolina) where Ivory-billed Woodpeckers disappeared while expansive areas of virgin forest still remained.

Snyder uses Tanner's own observations from the Singer Tract to counter the argument that food limitation caused the Singer Tract ivorybills to decline and that habitat destruction led to the extirpation of Ivory-billed Woodpeckers from this portion of Louisiana. Despite its pristine condition and what Snyder argues was a reasonable production of young, the Ivory-billed Woodpecker declined in the Singer Tract every year Tanner studied them. The Singer Tract population was headed for extinction whether the forest was logged or not. I agree with Snyder that the evidence for food limitation causing the decline of ivorybills in the Singer Tract is not convincing and the accounts of birds being shot in the Singer Tract are hard to dismiss.

Snyder's final point is that killing ivorybills with guns was widespread and persistent. All authorities who have written about the disappearance of Ivory-billed Woodpeckers—Tanner (1942), Cokinos

(2001), Hoose (2004), and Gallagher (2005), Jackson (2006), and Hill (2007)—acknowledge that in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, collectors shot out remnant populations of ivorybills from their last forest refuges. Snyder contends, however, that killing ivorybills for food and curiosity occurred throughout the range of the bird both in the U.S. and in Cuba for many decades before collectors went after the last birds. The evidence is necessarily anecdotal—nothing quantitative about the harvest of virtually any animal was recorded in North America until well into the 20<sup>th</sup> century—but I found this argument believable, largely based on personal experience from having lived in the Deep South for a large portion of my adult life. So, I will add a personal note. Since publishing a book on the search for ivorybills in Florida (Hill 2007), I have regularly given presentations to general audiences on ivorybills in Alabama and the Florida panhandle. Following several of these talks, elderly members of the audience have recounted tales about shooting ivorybills. These accounts generally involve old men whom the storytellers knew in their youth, so the tales typically go back about 80 to 100 years to the early 20<sup>th</sup> century. I have been told that in southern Georgia and the Florida Panhandle, everyone used to know that if you wanted something for the stew pot, you went to the swamp, banged twice on a bucket or a log, and shot the woodpecker when it came in. I was also told that ivorybill flesh was the favored mink bait used by trappers on the Pascagoula River in Mississippi. These tales reinforce the point being made by Snyder. There was a time when Ivory-billed Woodpeckers were regular targets of hunters.

Shooting as a cause for the decline of the Ivory-billed Woodpecker may have been downplayed in many ivorybill assessments because of a lack of understanding of the history of the Deep South. In the post-Civil War South, there was a level of poverty that is incomprehensible to Americans today. Starvation was common and in some parts of the rural South, people turned to any and all of forms of subsistence. During this period, for instance, gopher tortoises (*Gopherus polyphemus*) were harvested as food to extinction in many regions. Herons were shot to near extinction. Deer, turkey, and bear were extirpated from many regions of the South. Holt (1921) published an account of the decimation of southern wildlife in the late nineteenth century. He includes an account from W. C. Avery, dated 1876, of a slaughter of Red-headed Woodpeckers (*Melanerpes erythrocephalus*) around Hale County, Alabama that gives some idea how pervasive was the killing of animals including woodpeckers: "No bird affords a better mark for wanton shooters than this beautiful bird. Thousands perish because they are a good mark for a rifle shot . . . There used to be hundreds in Alabama where there is one now" (p. 62–63). In such a shoot-everything rural South, it is reasonable to suppose that ivorybills were shot in large numbers.

I return to the question that I posed at the beginning of this review: why did ivorybills disappear? Conventional wisdom is that habitat destruction was the reason for the demise of the species, with collecting playing a secondary and much less important role. Snyder's monograph flips this explanation. Overhunting was the primary cause of the disappearance with habitat destruction playing a secondary role. The implications of this argument are substantial. If the ivorybill was not a habitat specialist dependent on tracts of majestic virgin timber, then it becomes reasonable that remnant populations of ivorybills hung on in the vast but cutover forests of the south. Perhaps searches for remnant populations should be focused less on virgin stands of timber and more on areas where, historically, ivorybills were most abundant and where selective logging rather than deforestation occurred. If the species was shot to near extinction rather than passively pushed out of existence, then it follows that birds that persist would be the wariest, quietest, and shyest individuals.

I commend Snyder for challenging the conservation community to consider alternative explanations for the decline of the Ivory-billed Woodpecker. In the end, though, there is frustratingly little to go on to reconstruct the history and life history of this bird. It will not be difficult for critics to dismiss Snyder's case for overshooting and prop up the familiar argument that cutting big trees doomed the ivorybill. Perhaps a degree of ambiguity is fitting for a monograph on this enigmatic bird that will neither fade quietly into the ranks of species lost nor reveal itself long enough to be adequately documented.—GEOFFREY E. HILL, Department of Biological Sciences, Auburn University, Auburn, AL 36849. E-mail: ghill@auburn.edu

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