

The Case of the Ivory-Billed Woodpecker: The Scientific Process and How It Relates to Everyday Life*

by

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Part I—Background

Brad Murky, a graduate student in conservation biology at Cornell University, had been involved for nearly a year in a highly secretive research project taking place in the tupelo swamp of the Cache National Wildlife Refuge in Arkansas. In the early 20th century the eastern Arkansas forests were heavily logged to remove most of the large, old trees for timber. Along with the trees went one of the most majestic of all birds found in Arkansas, a bird so impressive that people exclaimed “Lord God” when they saw it fly. Now and again reports of the bird were made but dismissed as rumors. But now, Brad’s efforts and those of his mentors had paid off, yielding a huge discovery—a living Ivory-billed Woodpecker, a bird not documented in North America since 1944. The elusive bird had been captured on video a year earlier, and his team had decided that they now had enough evidence to go public. Brad’s elation was unrestrained as he envisioned the history he and his team were making.

Those jubilant feelings, however, had been invaded by a trace of doubt that was increasingly bothering him. Brad stared vacantly at the camera lights for the upcoming press conference and thought back to the email exchange of the past two days between him and his sister Mary.

Question

1. What evidence would convince you that the Ivory-billed Woodpecker is not extinct?



* This case study is fiction. Though based on events that took place in 2005, the scenario presented here is the creation of the authors. The main characters in this story and their opinions are fictional, but the presented evidence and the discussion points are authentic and were extracted from published articles in the scientific literature. While this case examines the scientific process and issues surrounding the announcements of scientific discoveries, there is no intention to present an opinion pro or con. Every effort was made to portray the scientific issues precisely and accurately. Any errors should be attributed to the authors and not to the original investigators.

Part II—The Main Evidence

Message 1: Brad's first e-mail to Mary.

4/26/05 12:15pm

Hey Mary--Things have been crazy here since we decided to go public with our evidence. I wish you could be here--it is so amazing to be part of this huge scientific discovery!!! I am sending you one of our key pieces of evidence, a video clip of "Elvis." This will confirm what we've believed all along--that the "Lord God Bird" is still alive!

The video is pretty short, but it clearly shows that this bird is quite large and has the distinctive white wing patterns of the Ivory-billed Woodpecker. You can see the extensive white feathers on the trailing edge of the wing as the bird flies, and the white shield on his back after he lands on the tree. Don't you dare tell anybody about this--it is still top secret! Later, Brad.

With hands shaking from excitement, Mary clicked the video link: <https://www.science.org/doi/suppl/10.1126/science.1114103/suppl_file/1114103s1.mov>

Question

1. Evaluate the merit of the video as scientific evidence.



Part III—Email Exchange

Message 2: Mary's reply to Brad.

4/26/05 9pm

Hi Brad, You've got to be kidding??!! All I can see is a flapping black and white bird!! How can you be so sure it is an Ivory-bill? Why not a Pileated Woodpecker? They have big white patches on the underside of their wings. You guys can't possibly stake your reputation on this!?! I have to go study for my bird class final. Cheers, Mary.

Message 3: Brad's rebuttal to Mary.

4/26/05 11pm

Mary, Come on--it is very hard to get high quality videos in the field. Some of our guys are the top birders in North America and have spent years trying to find an Ivory-bill. And as you can clearly see from their field notes (attached) they saw the white trailing wing patches characteristic of an Ivory-billed Woodpecker. They know what they are talking about. And OF COURSE the video is not the only evidence. We have more than 17,000 hours of sound recordings that include some "kent" calls typical for Ivory-bills. Not to mention that seven people have personally seen an Ivory-bill fly by anywhere from 15-150m away! So there! Good luck on your exam, Brad.

Message 4: Mary's reply to Brad.

4/27/05 2pm

Brad, I sure hope your seven observers have gotten a good look at the bird! Because I am not convinced by your "sound" evidence. Your recording may sound just like an Ivory-billed Woodpecker, but guess what: blue jays and nuthatches can also make "kent" calls. How do you know it wasn't one of them? I think you should forget about this piece of evidence, until you see an actual Ivory-bill making the calls. You guys

are crazy! You can't possibly plan a big announcement with that! Mary

Message 5: Brad's reply to Mary.

4/27/05 8pm

Mary, you just don't get it! You have to look at ALL the evidence! We have world-renowned experts on our team: they know their stuff! Sooner or later we will get a perfect picture of the bird! But if we wait too long we may miss our chance of protecting the last surviving Ivory-bills! They need huge protected habitats to stand a chance! We can't wait until we have searched the entire 550,000 acres in the Big Woods area: that would take years! On top of that it gets more difficult to keep this operation secret. We have more and more people snooping around. Stop being such a downer! You should be happy for me. Brad

Message 6: Mary's final comment to Brad.

4/28/2005 1am

Brad, are you saying that fame is more important than good science? That playing the odds is more important than the truth? I sure hope you turn out to be right! Not only because I really want to see an Ivory-billed Woodpecker myself, but because--if you are not--millions of dollars will be spent protecting a phantom bird, millions that will not be available for the protection of other endangered species!! Of course you guys could always say that you saw the last bird before it flew off into the thicket and died, making the species, finally, extinct! But seriously: I really want you to be right AND famous, but if you are wrong, you will be famous too... for all the wrong reasons. Be careful! Mary

Brad sat waiting for the news conference to begin with a feeling of dread. He couldn't stop thinking about his exchange with Mary. Suddenly an excited news reporter approached him "I got your name from one of the project leaders," she said. "You've been a valued member of the team, and I'd like to get a couple of quotes from you."

Questions

1. What is the major conflict between Brad and Mary in terms of the scientific process? Make a list of Brad's arguments and valid pieces of evidence and Mary's response to each.
2. What do you think about Brad's concern that by waiting with the announcement they could miss their chance to save the birds?
3. Imagine you are the owner of a company that owns the logging rights adjacent to the area of the woodpecker sightings, or a biologist trying to protect the habitat of another endangered species in another part of the state. Do you think that they would be satisfied with the same amount of evidence in this case as Brad? Why/Why not?
4. What is the right amount of evidence? How can you determine the answer to that question?
5. Give other examples of public discourse, policy decisions, or controversial issues where your insights from this case could be applied.
6. Decide how much evidence you would need to accept the claim that the Ivory-billed Woodpecker is not extinct.
7. Decide how much evidence you would need to accept that the Ivory-billed Woodpecker is extinct.
8. Put yourself in Brad's position—what would you have told the reporter?
9. Does it matter to you who presents the evidence?
10. Who presented the evidence in the real Ivory-billed Woodpecker case (who was present at the press conference)?



The field notes used in this case study were originally published as Fig. S1 of supplementary material to the June 3, 2005 article "Ivory-Billed Woodpecker (*Campephilus principalis*) Persists in Continental North America" by John W. Fitzpatrick et al. in *Science* 308(5727): 1460–2, <<https://doi.org/10.1126/science.1114103>>. Used with permission.

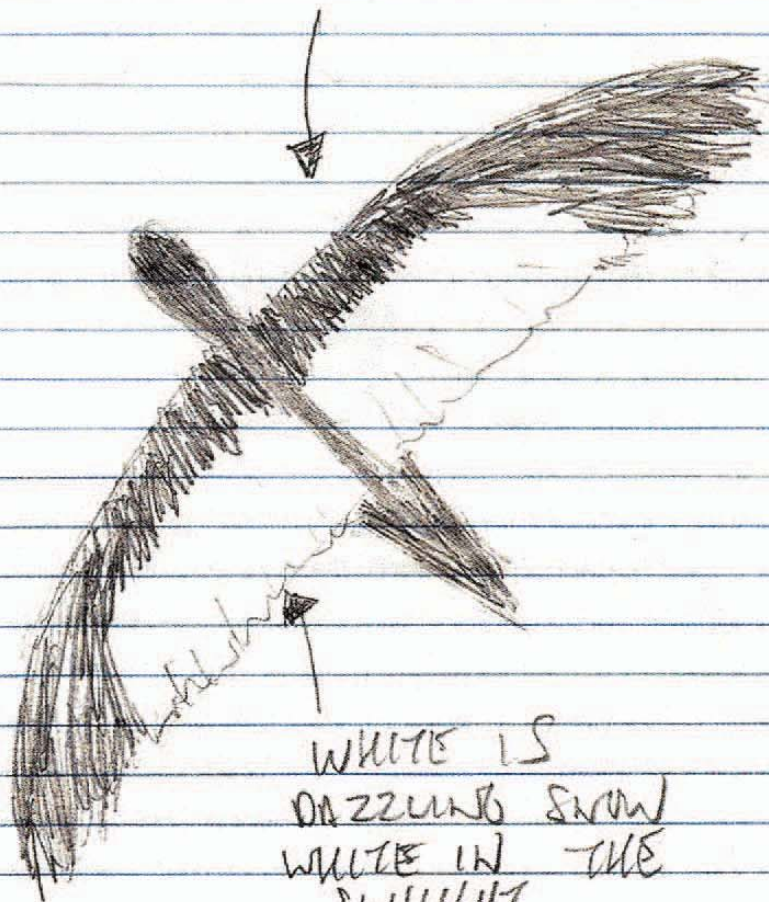
Details of Ivory-billed Woodpecker on page 1 (female) and page 2 (male) by J.J. Audubon.

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MY ENTIRE FOCUS WAS ON THE WHITE
AT THE TRAILING EDGE OF THE WING
AT THIS TIME OF BEST VIEW, DID NOT SEE
ANY RED, DO NOT HAVE A FIRM IMPRESSION
OF BILL SHAPE OR ITS CURVE.

BLACK AREAS ARE

JET BLACK

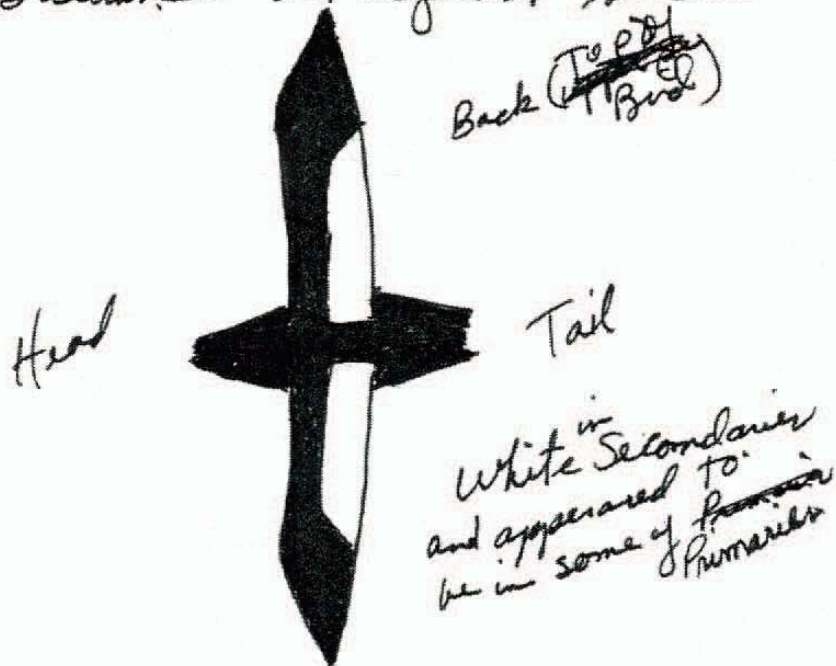


WHITE IS
DAZZLING SNOW
WHITE IN THE
SUNLIGHT

TIM GALLAGHER

A

Against a brilliant Black-
black of upper body & leading
edge of wing and most primaries.
I was captivated by the amount
of white on the wings and its
brilliance set against such



a brilliant black. Because
my eyes were drawn to the
contrast of black & white I
have no recollection of head
or tail feathers.

B