

Biologists Talks About His Chance Discovery Of Arizona's Second Salamander Species

By Mark Brodie

Published: Wednesday, June 12, 2019 - 12:23pm

Updated: Wednesday, June 12, 2019 - 3:24pm

Listen Now

Audio icon Download mp3 (8.62 MB)

Arizona Game and Fish Department

Sonoran Tiger Salamander

LAUREN GILGER: To a chance discovery more than a decade ago, we know that Arizona is home to not one but two species of salamanders. Andy Baldwin is the man who realized the state was home to twice as many species as previously thought. Baldwin is the chairman of the Biology Department at Mesa Community College. He recently spoke with our co-host Mark Brodie.

ANDY BALDWIN: I was on a school field trip, and in 2003, and I was doing what I do, which was flipping rocks and I uncovered something that should not have been there.

MARK BRODIE: How did you know that this was a species of salamander... that was new to this part of the world?

BALDWIN: It's well known that there's only one species of salamander in Arizona. So when I found something that wasn't it, it was something different.

BRODIE: How different is this species than the one that is native to here?

BALDWIN: Very different, it's night and day.

BRODIE: Like how?

BALDWIN: The tiger salamander, which is native, they get very large. I mean they can get up to 10 inches long... They start out with their life in the water, they have gills, they metamorph into like a tadpole becomes a frog, they lose their gills and become a terrestrial adult. This one that I found does not do that. It stays very small it's about 4 inches long maybe up to 5 inches and it does not have any life stage in the water at all.

BRODIE: So were you able to identify it as different as soon as you saw it?

BALDWIN: Oh instantly.

BRODIE: So what did you do?

BALDWIN: I freaked out. Pretty much abandoned the school field trip to my colleague and says, "I have something else I need to do right now." So I went on this path of destruction to uncover a few more, if I could, and I ended up finding one more individual that day.

BRODIE: And what did you do with them?

BALDWIN: I brought them back to Mesa Community College. I needed to have voucher specimens because if I just said, "hey I found this," and didn't have anything to show for it, no one would believe me. So I kept them and I preserved them. So they're dead and they're in a jar now. But I also clipped a bit of their tail off so that I had a DNA sample so that I could do some DNA analysis.

BRODIE: And what did that analysis tell you?

BALDWIN: It indicated that those specimens of salamanders had not been present. Or they weren't very different from the salamanders, that were like them, that were native to California. So that indicates that they hadn't been there for very long.

BRODIE: Do we know how they got here?

BALDWIN: We do. It was sort of a roundabout way but the salamander community is sort of a small close knit community. So word got out pretty quickly that I had found this species in Arizona. And so as

word spread, so word finally got to the person that actually released these salamanders back in the 1980s at that site. And he gave me a phone call.

BRODIE: Why had that person done that?

BALDWIN: So this person was a big fan of this species that was native to California. And he saw or thought that this species was being threatened and was perhaps going to go extinct. So he thought, in a chance to sort of you know air quotes save the species, he was going to collect a few from California drive them out to a suitable habitat elsewhere in Arizona and turn them loose. Didn't tell anybody, of course that was illegal to do, scientifically immoral to do. But nevertheless, he thought he was doing the right thing for the species and that's what he did.

BRODIE: Well it seems as though despite the illegality and immorality of it, it sounds like at least to some extent his plan worked.

BALDWIN: It did so for 20 plus years that population remained undiscovered and obviously it was doing well because those original animals that were released had long since died but they reproduced before they died. So what I was collecting was, you know, several generations down from that original population.

BRODIE: Anytime you introduce something new into an ecosystem obviously there are impacts... Have there been impacts to this new type of salamander in that ecosystem in Arizona?

BALDWIN: Unknown. That's a great study that could be done. I mean, what is the impact of introducing a salamander to... an area or ecosystem that didn't originally have them? Probably, it's a fairly small impact as the salamanders live underground most of the time. They aren't large predators, they eat insects, there aren't that many things that eat them. So I don't really know what level impact they would have. But you make a good point. I mean, they probably do influence it in some way. We don't know how many individuals there are there. How widespread is this population? We don't know that either.

BRODIE: What is the significance of this find? I mean why is it important that you discover that this new species... new to Arizona species was in fact in this state?

BALDWIN: There are a couple of factors that I think make this important. One, is that it's always been suspected that there is a population or there could be a population of salamanders in Arizona. And there

have been dozens of researchers that have spent hundreds of hours looking for salamanders and have never found them. And then here I flip a rock, my first you know summer out to Arizona, and I find a salamander. So I guess my first point is it shows the salamanders of this family can live in Arizona as they've been suspected for, forever. The second point that I think that makes this important is, even though this was an illegal introduction it sort of has set up an experiment, actually, multiple experiments that could be followed up on. We have a starting set of parameters that you just simply don't know with a wild population. So here we are trying to estimate, you know, genetic mutation rates and we're trying to estimate evolutionary patterns and we're doing these with wild populations and we're having to make assumptions on what we started with. Well here we don't have to make those assumptions we know exactly what we started with. So I think it gives sort of this wild natural laboratory experiment that people could follow up on.

BRODIE: All right that's Andy Baldwin chair of the Biology Department at Mesa Community College. Andy thanks for coming in.

BALDWIN: Thank you very much. I appreciate your time.