Outline your teaching experience, your pedagogical approach and (potential) innovation to teaching relevant topics from 1st to 4th year of an undergraduate degree in ecology, evolution, and conservation

• Training and Teaching

Teaching and mentoring the next generation of students is essential to build a society of critical thinkers and creative problem solvers. This includes students that will go on to careers in science and a host of other fields. I enjoy teaching and learning alongside students because I find it easy to engage naturally and see my own enthusiasm reflected in their learning. As a Master's student I was a teaching assistant for all three years, including voluntarily in my second and third years (I was supported by a fellowship and external funding). I honed my skills in introductory biology lab courses, learned to develop and implement my own grading scheme teaching evolution, and practiced lecturing and course organization in comparative vertebrate anatomy. I enjoyed the "right of passage" that is teaching introductory biology because of the broad cross-section of student backgrounds and interests, and the freedom to design my own lab experiences and assessments. Upper level classes like evolution and comparative anatomy offered the opportunity for a more conversational approach, and I was able to integrate more varied readings to accompany the classes At the University of Sydney I would be excited to teach courses oriented towards evolution and ecology, as these are disciplines I am deeply familiar with. For example, I would be comfortable teaching parts or all of introductory courses such as From Molecules to Ecosystems, Life and Evolution, and Zoology. I would also be thrilled to teach higher level courses such as Evolutionary Biology, Australian Wildlife Biology, and Evolution of the Australian Biota. These courses play to my strengths as both an evolutionary biologist and naturalist, and it's exciting to imagine the chance to adapt and build on these courses, adding my unique flavour to the curricula. If the opportunity arose, I would also love to design my own course. Given existing expertise in SOLES, and my own background, a course such as Macroecology/Macroevolution or Data Science in Biology seem complementary to existing offerings. My enthusiasm for design and presentation skills could also be useful for an advanced undergraduate/postgraduate course on visual communication and public facing outreach, which would be a natural extension of my *Communicating Through Figures* workshop. Regardless of the topic, I feel strongly that students should be provided a good foundation in quantitative skills to accompany their anticipated writing abilities. Many careers nowadays rely on having some experience with programming languages, so I highly encourage teaching and learning basics of common languages such as Python and R, and am comfortable teaching these skills.

• Pedagogy

While the contemporary learning experience has changed significantly since my days as an undergraduate, I have embraced many of these changes in my own approaches. Following the most prevalent shift in common pedagogy I feel strongly about the efficacy of the flipped classroom, which allows students the flexibility to process lecture material at their own pace, and enhances the value of face-to-face time. As a student, I often found that the pace of a standard lecture didn't allow me time to digest material. As a result, I felt unprepared to ask questions and push the ideas further. The immediacy and accessibility of modern recorded lectures eases this, and I think, has provided a more valuable learning experience and more effective use of face-to-face time.

Current students often feel adrift in a sea of information—whether they realise it or not—that is flooded with both accurate and inaccurate takes. Wikipedia, popular news, and even Large Language Models (LLMs) like ChatGPT can give varied answers to the same question. Now more than ever, it's important to emphasise the power of critical thinking. As a pedagogical basis, I feel it's necessary to teach students how to use these tools in the most efficient and effective ways. LLMs can be used to summarise lectures, generate example test questions, and even proofread text, and so leaning into these technologies, instead of shying away from them, will prepare students better for challenges ahead.

I am a strong advocate for experiential learning and believe student-lead exercises can be remarkably potent. In particular, my experience is that students can be very effective science communicators, par-

ticularly to their peers. Harnessing students as a vehicle for science communication in a guided setting can be a powerful tool for social learning. As a science commuincator myself, I feature in videos that have been watched thousands of times, regularly speak to the public, and in 2018 I was named by the Science Educators Association of the ACT as their ***Hero of Science***. I also engage in virtual outreach and am a scientist member of the non-profit Skype-a-Scientist organisation, which has connected me with classrooms in the USA, Thailand, and Myanmar.

Overview of your teaching philosophy (i.e. what are the important ingredients in creating a quality student experience)

Students learn in many different ways, and so identifying successful paths of communication and tailoring practices to the audience is fundamental to effectively sharing knowledge. In one word, this means being **flexible**. My experiences as an educator have taught me to always emphasise how extraordinary our knowledge and abilities are, and to never undervalue a well timed joke. Enthusiasm is infectious and positive reinforcement holds real power. I believe it is essential to both challenge our students and foster a supportive learning environment that is free of judgment, so that students feel comfortable and motivated to learn. Given the right opportunities, all students can allow their curiosity to bloom and engage with the material constructively. This is most evident through an **experiential and inquiry-based approach to education**. While it sounds obvious, the way we *do* science, should also be the way we *teach* science.

As a presenter, I have always relied on a potent combination of strong visuals and attention-grabbing examples. Together these can provide a key to unlock complex ideas and theories. Presentation aesthetics help to keep viewers engaged, that's why most of us watch or read the news instead of listening to the radio. I think there is also value in incorporating additional voices. Asking for short research-based segments from colleagues and even David Attenborough clips on YouTube can help to change the pace and style to reach students from a different angle. Pairing theory with approachable examples allows students to solidify the connections and make the next steps on their own.

An example of your teaching, by showcasing a solid teaching method for a tutorial experience in your area

My experiences have taught me that allowing students to lead their own learning through independent projects can really emphasise the **creative freedom** that helps complex topics to stick. In teaching an upper-level undergraduate evolution course at Villanova University, I saw this time and time again as students chose a taxon of their interest to sequence for a molecular marker and combine with existing GenBank data. Of their own accord, students collected insects from windowsills, went to fish markets to sample produce, and even contacted the local zoo to ask for material from rare and endangered species. Through the semester they advanced from abstract ideas of molecular phylogenetics to executing guided labwork, resulting in tangible sequence data. Their "fieldwork" meant they were **more invested in the outcomes** of the projects and how the process worked, and paid dividends for their learning. As a result, students felt **actively** engaged in the process of learning, instead of exclusively being taught.

As an example of the tone and energy of some of my less-formal teaching, you can see me answer audience questions about reptiles on the Natural History Museum UK's YouTube channel *Nature 101* and *Hidden Treasures*. To see an example of my course design you can check out the NHM's new Naturally Curious class I designed and delivered on the evolution and ecology of snakes. The course consists of 18 mini-lectures (3-10 minutes each) spanning the origin of snakes, their biogeography, anatomy, and even conservation concerns. Feel free to use login **ian.brennan4@nhm.ac.uk** and password **NatCurious2024$** to learn more about snakes, and me.