



From Extinction to Opposition: The Double Threat Facing Zoology in Modern Society through the Lens of Australia

Gargee Basu ^{a++*}

^a School of Law, Brainware University, Barasat, India.

Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: <https://doi.org/10.56557/upjoz/2025/v46i115007>

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://prh.mbimph.com/review-history/4913>

Review Article

Received: 20/03/2025

Accepted: 22/05/2025

Published: 24/05/2025

ABSTRACT

The overarching theme of *Science Under Siege: Zoology Under Threat* highlights the urgent need to reject the idea that science is optional or dismissible in today's society. Much of the pushback against science, including zoology, comes from religious groups, political interests seeking short-term benefits, or from philosophical views that oppose the scientific study and management of wildlife. An extreme stance within the animal rights movement also opposes conservation efforts, even though ethical considerations regarding animals and the environment are essential for their sustainable management. Brian Martin, in his insightful piece *Breaking the Siege: Guidelines for Struggle in Science*, notes that when science comes under attack, opponents often use tactics to minimize public outrage—such as covering up their actions, discrediting the targets, reinterpreting events, or using official channels to create an illusion of fairness. Currently, zoology and zoologists are facing such attacks, and the continued degradation of our ecosystems is a disturbing

⁺⁺ Assistant Professor;

^{*}Corresponding author: Email: dgb.law@brainwareuniversity.ac.in; basugargee14@gmail.com;

Cite as: Basu, Gargee. 2025. "From Extinction to Opposition: The Double Threat Facing Zoology in Modern Society through the Lens of Australia". *UTTAR PRADESH JOURNAL OF ZOOLOGY* 46 (11):82-92. <https://doi.org/10.56557/upjoz/2025/v46i115007>.

consequence. In Australia, the accelerating extinction rates, fuelled by invasive species, climate change, and habitat destruction, are steadily erasing the country's rich zoological heritage. This paper has been conducted through the analysis of secondary data sources, including published scientific literature, policy reviews, and ethical critiques. No primary data collection was undertaken. The reliance on secondary data ensures that the arguments presented are rooted in peer-reviewed evidence and authoritative documentation relevant to the intersection of zoology, ethics, and environmental governance. The collected literature was examined to trace common themes, prevailing arguments, and underlying conceptual structures relevant to the research focus.

Keywords: *Animal rights; betrayal of science; climate change; commercial harvesting of kangaroos; invasive species.*

1. INTRODUCTION

Initially, we approached the topic of *Science Under Siege: Zoology Under Threat* with some hesitation, as the title felt overly bold. However, after reviewing the discussions and contributions in this collection, we are more convinced than ever of its relevance and urgency. Paul Willis, a former journalist and current director of the Royal Institution of Australia, reflected in the foreword on the troubling escalation of hostility toward science: threats have been made, public protests have called for halting scientific research, and prominent figures in the media have disparaged scientists. There have been job cuts in research fields, a reduction in funding, and other challenges that would have seemed unimaginable not long ago. This sentiment was echoed by many participants in the forum. Zoology is under threat, and wildlife populations continue to decline. Climate change is a key factor, along with ideological and commercial interests that undermine or selectively accept scientific findings. This review aims to reinforce these conclusions, drawing from the diverse perspectives and discussions presented in the book. Our focus is on understanding Australian fauna, exploring strategies for its conservation, and encouraging all Australians to play a part in preventing the ongoing loss and extinction of species. When opposing views hinder efforts to manage and study wildlife or promote actions that degrade habitats for financial gain, we firmly oppose them. As these attacks on science grow, so does the harm to our fauna, leading us to identify the issue as one of zoology under threat, and more broadly, science under siege. Moreover, an attack on one field of science often has ripple effects, creating an environment where denying science becomes acceptable rather than integrating its findings into decision-making processes. We begin by presenting a recent, local example of zoology being undermined, which came to light as we were preparing this paper. A colleague informed us about staff cuts

in 2011 at the Forest Science Centre, part of Forests NSW. Though the issue received some media attention, it is important to document this decision as part of the broader theme of science under siege. Two independent sources highlight this case: a letter to the *Sydney Morning Herald* and an article in *The Conversation*. These sources reflect concerns within the Royal Zoological Society of NSW and its leadership. Saunders, writing for *The Conversation*, questioned the New South Wales Government's stance on science, highlighting the critical research performed at the Forest Science Centre on biodiversity, climate change, and more. The budget cuts threatened this vital work, which not only supported sustainable forestry but also had broader ecological and agricultural impacts. Saunders pointed out that the public was largely unaware of the importance of this research and emphasized the responsibility of scientists to engage with the community. In a letter to the *Sydney Morning Herald*, forest scientist Dolan Nichols expressed his concern about the loss of expertise at the Forest Science Centre, warning that short-term profit was being prioritized over long-term ecological stewardship. He also addressed a common misconception that managed forests hold no ecological value, arguing that keeping scientists in these environments is essential for sustainable management. This issue extends beyond Forests NSW and affects government scientists nationwide, as Charley Krebs highlights in his contribution to this book. While these specific cases illustrate the broader problem, we return to the general theme of science under siege, recognizing the systemic challenges faced by those working to address the critical environmental issues of our time.

2. GLOBAL SPIN

In her insightful book *Global Spin* (2002), Beder explores the corporate attack on environmentalism. One chapter focuses on the

issue of global warming and the confusion intentionally spread by corporate interests. Beder points out that when the U.S. pulled out of the 1997 Kyoto agreement on climate change in early 2001, it stunned the world. At the time, White House spokesperson Ari Fleischer explained, "The president has been unequivocal... He does not support the Kyoto treaty. It is not in the United States' economic best interests." Ian Wallis also highlights this type of reasoning in his own work, offering an example that contrasts government spending on studying bears in Montana with the seemingly unquestioned cost of the Iraq war. This critique resonates with others who are deeply concerned about how science and the environment are being undermined. Robert F. Kennedy Jr., in his book *Crimes Against Nature* (2004), criticized the Bush administration, emphasizing the destructive impact of those who prioritize profit over the planet. Similarly, Mooney's *The Republican War on Science* (2005) is a bold call to recognize this growing assault on scientific integrity. Paul and Anne Ehrlich (1996) also discuss the betrayal of science, warning about the dangers of anti-environmental rhetoric and its potential to harm future generations. They urge scientists to step outside the lab and engage with the public, insisting that educating others should be a core responsibility of every scientist. Despite a reluctance within the scientific community—often due to the lack of professional rewards like tenure or promotion—the Ehrlichs argue that public involvement is critical, especially in fields like ecology that are vital to humanity's future. They stress that the reward system in academia needs to change to value outreach efforts. In 1981, Bolton summed up Australia's environmental history as a clash between those driven by economic exploitation and those seeking to create a sustainable relationship with the land. As these ideological battles continue, it's clear that science, especially fields like zoology, faces significant challenges if those prioritizing exploitation over preservation gain ground. This tension between science and outside forces is nothing new. Figures like Galileo serve as reminders of the enduring struggle between evidence-based knowledge and other belief systems. Perhaps no intellectual shift was as monumental as Charles Darwin's theory of evolution, presented in *The Origin of Species* (1859). His work profoundly challenged both biology and society, marking a turning point in the history of science. Yet, even today, debates about Darwin's theory persist, as Martin Bradstock and Rob Brooks discuss in their

papers. The notion that one can choose to accept or reject evolution, opting for a belief-based alternative, remains astonishing in a world where education and critical thinking are so widely valued.

3. EXTREME ANIMAL RIGHTS

A troubling twist on a certain philosophical approach that dismisses science is evident in the growing influence of extreme animal rights groups. These groups oppose any study or commercial use of animals and are against managing animal populations to prevent extinctions or control invasive species. Menna Jones and her team highlight a striking example of this issue in their research on Tasmanian devils. Despite their work focusing on saving a species nearing extinction, they faced resistance from an Animal Ethics Committee. It's baffling how such crucial research could be stalled. Menna and her team deserve credit for speaking up, as these issues need open discussion, not secretive roadblocks. In Australia, the standard approach to animal treatment is welfare-based, demanding high standards of care and accountability. However, extreme animal rights advocates reject all forms of human-animal interaction. This creates a major challenge for science, as these groups oppose almost all animal-related studies, even when the research is geared towards conservation, such as wildlife surveys, museum collections, or teaching zoology students. They're even against controlling invasive species that are devastating native wildlife. While some see this as a compassionate stance, it could ironically accelerate the loss of Australia's native fauna, allowing invasive species to dominate. Claiming moral superiority in this case reflects a misunderstanding—or lack of knowledge—of zoology. To see this in action, you can look at books advocating for animal rights. Many of them, like DeMello's *Introduction to Human-Animal Studies* (2010), focus on fields like anthropology, art, or philosophy, but leave out zoology entirely. This gap in understanding can lead to flawed perspectives on how to balance animal welfare and environmental conservation. In contrast, Sunstein and Nussbaum's *Animal Rights* (2004) presents a more nuanced look at the topic. One essay by Anderson points out that animal rights and environmentalism often conflict. For instance, in Hawaii, feral pigs are destroying rainforests, and in Australia, rabbits are pushing native plants to extinction. Environmentalists advocate controlling these

populations, but animal rights activists oppose it, seeing it as a violation of the animals' right to life. Anderson argues that while animals have moral worth, ecosystems deserve protection too. She suggests that protecting ecosystems isn't just about stopping humans from exploiting them, but also preventing animals like pigs and rabbits from causing harm. Her point resonates: we already have laws to protect ecosystems and endangered species, acknowledging that the environment shouldn't be sacrificed for human gain. The same logic applies to invasive species—just as we wouldn't let humans destroy ecosystems, we shouldn't let invasive animals do so either. Anderson points out that it's our own actions that have made invasive species like feral pigs and rabbits so destructive to ecosystems. While humans have the ability to negotiate and find compromises on environmental issues, Anderson argues that animals, like these invasive species, can't be reasoned with—sometimes forceful measures are necessary to stop the damage they cause. Anderson also uses the term "animal welfare" in a way that differs from the common Australian understanding, grouping it together with animal rights. This makes it important to recognize how definitions can vary when debating these issues. Paul Waldau, in his book **Animal Rights: What Everyone Needs to Know** (2011), offers a thoughtful exploration of animal rights and the survival of wildlife. Waldau emphasizes that one of the most fundamental questions we face is: "What kind of world are we leaving for future generations?" He points out that many habitats and wildlife populations are already under threat, and the situation will likely worsen due to habitat destruction, invasive species, extinction, and the spread of diseases between humans and animals. Waldau also notes that while we have made strides in protecting even less popular species and whole ecosystems, society remains largely indifferent to the plight of many at-risk animals, including some of the most iconic species. However, he is hopeful that human-nonhuman relationships are evolving in positive ways. Waldau's discussion of animal rights expands the concept beyond its typical association with extreme views. He argues that the movement benefits from open-minded scientific communities and stresses that ethics and science should always be in dialogue. We don't disagree with this approach, but the details are crucial. Our objection arises when extreme animal rights advocates go so far as to grant all animals—particularly mammals and birds—equal status with humans, which in their view prohibits

vital research and wildlife management activities. This stance, we believe, undermines efforts to study and conserve Australia's native wildlife. Interestingly, Waldau's concern for wildlife, framed as an ethical issue, aligns with our own conservation goals. In fact, ethical treatment of animals and the environment is essential to the long-term management and protection of native species. We've explored this in greater detail elsewhere (Lunney 2012a, b, c), but the central idea remains the same: extreme animal rights positions can be harmful to conservation efforts. However, a balanced, ethical approach to animals and their habitats is vital, and we welcome the ongoing debate on the issue. Finally, it's important to be clear about what people mean when they use terms like "animal rights" and "animal welfare." These phrases don't have one fixed meaning, and it's essential to understand the context when someone claims to support them. Depending on how they're defined, these terms could either support or hinder the very conservation efforts aimed at protecting Australia's native fauna.

4. A WEAK UNDERSTANDING OF ZOOLOGY

One of the most frustrating challenges we face today is the rise of arguments that masquerade as scientific while actively undermining science itself. These arguments often use the language of science, but they are built on weak or misguided understandings, especially in fields like zoology. We see this when groups with an agenda, whether it's opposing animal research or promoting a religious worldview, challenge science in favor of philosophical or theological interpretations. This is especially concerning in matters like wildlife conservation, where decisions must be informed by evidence and scientific understanding, yet some advocate for approaches that disregard the facts. We need laws to protect threatened species, establish national parks, control invasive species, and promote sustainable land management because human activity has drastically altered the planet's ecosystems. This is all too evident in the mass extinction we're currently witnessing. It's hard to even grasp the severity of this loss without a foundation in science, which provides us the tools to understand the damage and offer solutions. But the continued degradation of our natural world is happening, and it's shocking how often decisions are made that worsen the situation, whether by depleting resources, threatening ecosystems, or denying the role

humans play in climate change. The notion that science can somehow be sidelined or dismissed until it's convenient—or that it can always fix the problems after the fact—is dangerously flawed. Experts like Hoegh-Guldberg, who focuses on the Great Barrier Reef, and others like Dickman, Danks, and Grant have highlighted the high cost we'll pay for ignoring science in favor of short-term profits. This cost will not only be the loss of our natural heritage, but it will also create a heavy burden for future generations who will have to attempt to repair the damage. Yet, in some areas of society, science seems to be treated as optional. Medical and defense research may get the funding they need because the stakes are clear and immediate. But when it comes to protecting our environment and wildlife, there's often less urgency. A good example of this is the ongoing debate over climate change, where scientific consensus can be undermined by public scepticism and biased media coverage. As Hutchings notes, while governments acknowledge the importance of biodiversity, that understanding rarely translates into sufficient funding for conservation efforts. Early-career scientists also struggle to find opportunities, which raises concerns about the future of fields like zoology, where research is essential for understanding population changes and the impact of human activities on ecosystems. In many discussions, particularly in environmental debates, science finds itself pitted against short-term material benefits. Economic development and resource extraction may bring immediate rewards that are easy to quantify, but the long-term benefits of preserving ecosystems and funding scientific research are often overlooked. This short-term thinking makes it hard to communicate the value of science, which often requires patience and long-term investment to yield results. During several recent forums, speakers consistently emphasized that scientists need to be more vocal in advocating for the animals and ecosystems they study. As David Horton pointed out, too often scientists hesitate to speak up when their findings could have a real impact. When we know that a species is threatened, for example, we shouldn't downplay the urgency or hedge our statements out of caution. Instead, we need to be clear and forceful about the stakes. Harry Recher expanded on this, noting that sometimes the scientific community itself has been too slow to act. Even as concerns about global warming grew, a significant number of scientists held back, waiting for more data. By the time that data was available, the window to prevent serious

consequences had likely already closed. Recher's point underscores the need for scientists not only to conduct research but also to advocate for its use in public policy. It's not enough to simply present facts to a public that may not be equipped to understand or act on them—scientists need to lead. This call to action was echoed by several others, including Gordon Grigg, who criticized the way funding models have eroded the credibility of scientific institutions like CSIRO and universities. He argued that the corporatization of universities under previous governments has had a negative impact on the integrity of scientific research. Nick Holmes also pointed out that the rise of postmodern thinking, where all ideas are considered equally valid, is fundamentally at odds with the scientific method, which demands that ideas be tested and measured against reality. Charley Krebs added that retired scientists, particularly university professors, often serve as the conscience of society when it comes to ecological issues. Even before retirement, scientists should feel empowered to speak out against harmful policies and practices, something that can be difficult for those still bound by the demands of their institutions or corporate sponsors. In response to these discussions, the Royal Zoological Society of NSW held a forum on the role of scientists as the ecological conscience of the nation. The forum emphasized that you don't need to be old to be "grumpy" about the state of the environment—a passionate and critical stance on ecological issues can and should emerge much earlier in a scientist's career. The humor found in grumpiness, as popularized by shows like *Grumpy Old Men*, serves to highlight the seriousness of these issues while making the conversation more accessible. Ultimately, the debate about the role of science in society is not just about data and research—it's about values, communication, and advocacy. Scientists must not only contribute their expertise but also help guide society toward solutions that balance development with the preservation of our natural world.

5. ANIMAL ETHICS MATTERS

A lack of understanding of science often leads to a flawed application of ethics, particularly in fields like zoology. Menna Jones and her colleagues shared their challenging experiences navigating the Animal Ethics Committee while working with Tasmanian devils. Reflecting on their paper, and on whether animal rights activism could be

considered a significant threat to Australian wildlife, we find ourselves wondering how many important studies go unpublished due to fear of backlash from these committees. Instead of presenting our thoughts on animal ethics during the forum, we've decided to address the topic here. It's clear that many research zoologists are concerned about the ethics approval process, as their ability to conduct research hinges on a single committee's approval. But if another committee might find the same research protocol acceptable, there's no mechanism to allow for that perspective to be considered. The grievance process is flawed, as complaints are usually directed back to the same committee that originally denied the research, creating a cycle where nothing gets resolved. This has a chilling effect on submissions. The process itself, with some committee members hesitant to approve research they may later have to defend against public scrutiny, can lead to unnecessary delays or rejections. This issue was raised during the forum's discussions. In one of the plenary sessions, Rachael Dunlop asked Peter Banks if he was aware of recent violent protests at the University of Santa Cruz, where researchers faced firebombing and threats. Some had to abandon their work because their families were being threatened, their homes vandalized, and their cars set on fire. She asked if he thought this was a result of people not understanding the strict animal ethics rules that scientists follow to ensure animal welfare. Banks responded by acknowledging that these individuals likely don't understand the process. He referred to them as fundamentalists, explaining that they hold extreme views that reject the framework within which scientists operate. Their philosophy doesn't recognize that the ethics process is designed to balance animal welfare with research needs, making it difficult to engage with them. His advice to fellow scientists was to be prepared to defend their work and stay focused on the broader goals of their research, even when facing narrow-minded opposition and violent actions. Terry Dawson joined the conversation, sharing his own experiences working with kangaroos. Now retired, he feels freer to speak openly, but when he was actively researching, any mention of his work in the media would trigger a flood of complaints to his university and the Animal Ethics Committee. Early in his career, these complaints created significant challenges. While things eventually calmed down, Dawson noted that, as a physiologist working with kangaroos, he was often viewed as a villain by certain groups. He

had to be incredibly cautious about how he and his students communicated their work to avoid backlash. Dawson explained that, despite these external pressures, his Animal Ethics Committee was mostly supportive. They understood the sensitivity of his work and took great care to protect him and his team. He would go through the committee's process in meticulous detail to ensure that everything was transparent and above board. Once his proposals were approved, the committee stood by him, providing the necessary support to continue his research, even when facing hostility from the public. These discussions highlight the delicate balance between advancing scientific research and navigating public opinion, particularly when it comes to animal ethics. While the systems in place aim to protect both animals and researchers, the fear of public reprisal can sometimes stifle important scientific work. The conversation makes it clear that, in addition to ethical compliance, scientists need to be advocates for their own work, standing firm in the face of criticism and ensuring that sound research continues despite external pressures.

6. FUNDING OF SCIENCE AND SCIENTISTS

In his closing remarks at the final plenary session, Nick Holmes highlighted three key issues that arose during the discussion. The first, and perhaps most concerning, is the declining public interest and understanding of science. Holmes noted the growing trend of intellectual complacency in society and questioned what could be done to counteract it. He suggested that the best approach is to support media figures like Mark Horstman, an ABC journalist who facilitated the plenary sessions, and other allies in the media who understand the value of science. The second issue Holmes addressed was the misuse of science by government agencies and other institutions. He pointed out that those who are retired, like himself and Gordon Grigg, can speak freely and critically about these issues, using solid data to back up their claims. However, for scientists who are still in the field and potentially vulnerable, Holmes suggested that scientific societies could offer some protection by issuing broad statements on behalf of their members. The third, more implicit issue, was funding. Holmes expressed concern that criticizing government policies could jeopardize funding for science. Though this topic wasn't directly discussed in the session, he saw it as a looming problem. Pat Hutchings' paper in this forum emphasized just how critical the issue of funding

is, especially for research on less glamorous species and the scientists who study them. This problem isn't unique to Australia. A 1969-1970 Science News Yearbook from the U.S. revealed similar concerns. It noted that U.S. scientific research suffered major setbacks in 1968 due to the Vietnam War, leading to a significant reduction in federal research and development funding. The momentum for large-scale scientific initiatives, like the International Biological Program, also faltered due to lack of funds, despite promising starts. The text lamented the failure to secure interest or support for tackling environmental issues on a national scale. Holmes argued that bold statements like those made in the U.S. are needed in Australia to drive home the point that inadequate science funding undermines essential long-term projects. These projects, which are crucial to addressing national and international challenges, require sustained government support.

As of 2012, Holmes and his colleagues were well aware of budget cuts hitting universities and government departments across Australia. Environmental conservation, research on native fauna, climate change, and scientific careers were all being impacted by these cuts, reflecting broader societal issues. Holmes stressed that sidelining science or cutting scientists would only worsen these problems. The absence of skilled scientists in critical fields, he argued, constitutes a major threat to fauna conservation and management. Without continuity in both research and personnel, efforts to understand, protect, and restore wildlife are doomed to falter. The story of the collapse of the CSIRO Division of Wildlife Research, shared by Charley Krebs, underscored just how vulnerable Australia is to losing its top scientific minds. Once regarded as the leading wildlife research institute in the country, the division's downfall illustrated the risk of underfunding. Liza Miller further emphasized the personal toll of these cuts, noting that it's not just science that suffers but also the individual scientists. When funding is slashed, experts with decades of training and experience are left without work, often forced to leave their fields entirely. This loss of talent, often due to short-sighted budgetary decisions, can have long-lasting effects on the discipline as a whole. Holmes concluded by reinforcing the importance of maintaining both scientific institutions and the experts within them. Just as we aim to protect wildlife, we must also ensure that the scientists studying and conserving them are given the support and stability they need to succeed.

7. RESPONDING TO THE CHALLENGE

Brian Martin, in his thought-provoking paper "Breaking the Siege: Guidelines for Struggle in Science," discusses how attacks on scientists often follow predictable patterns designed to minimize public outrage. These tactics include covering up the actions, devaluing the target, reinterpreting events to make them seem justified, using official channels to create a sense of fairness, and intimidating those involved. To effectively push back, Martin suggests countering each of these strategies: by exposing the truth, validating the individuals under attack, highlighting the unfairness, building public support, avoiding over-reliance on formal processes, and resisting intimidation. Martin's observations provide a useful framework for understanding scientific conflicts. For example, Rosie Cooney and her team took on the task of correcting misinformation in the ongoing debate over kangaroo harvesting and conservation. They examined a recent report from the Think Tank for Kangaroos (THINKK), housed at the University of Technology Sydney, which claimed that eating wild-harvested kangaroo meat was not as environmentally beneficial as often argued, particularly when compared to other meats from rangelands. Cooney's team, after reviewing the available scientific literature, found that the THINKK report was neither well-argued nor accurate. In their view, it contributed misleading information to the public and scientific discourse surrounding kangaroo management. Gordon Grigg further critiqued the THINKK report, treating it as he would any paper submitted for peer review—though notably, the report hadn't gone through peer review. Grigg pointed out that the publication built its argument on four key assumptions, three of which were significantly distorted, while only one had any relevance to the current kangaroo industry. He concluded that the THINKK report did not meet the standards required for scientific publication. There's an interesting epilogue to this story. After receiving feedback on their report from Rosie Cooney, the lead author of the THINKK publication was invited to respond. However, they requested that their reply be the final word on the matter. As editors, we couldn't accept that condition, and the conversation stalled. This raised an important editorial question: when should a debate be considered over? The kangaroo harvesting issue first became a topic of public discussion in 1987, with a paper by Gordon Grigg. Given its long history, we see no reason to end the debate now. Moreover, from

an editorial standpoint, it's not sound practice to allow any side of a discussion to claim the last word. As Grigg emphasized, the ultimate criterion should always be whether a manuscript holds up to rigorous peer review, and that's how scientific debates should be judged.

8. ISSUES WITHIN THE SCIENCE COMMUNITY

The scientific community is incredibly vast and diverse, with a wide range of perspectives that often spark lively debates. One example is the ongoing conversation about the role of dingoes in ecosystems. Brad Purcell and his colleagues have offered a particular viewpoint, examining cultural and scientific challenges surrounding dingo management. They concluded that reducing conflicts of interest, whether cultural or financial, could pave the way for more effective dingo conservation efforts. Similarly, Bob Kearney challenged the commonly held view that overfishing is the primary threat to our fisheries, suggesting instead that land-based pollution is a much more significant but underrecognized danger to fish populations. On another note, Shelley Burgin and Adrian Renshaw explored the impact of funding cuts on scientific research. They argued that while science is under pressure, this strain has also driven positive changes in how research and teaching are connected. Mike Calver and Kate Bryant took on a lesser-known issue within the scientific world: the growing reliance on bibliometric measures, like citation tracking, to evaluate research. They explained that citation tracking was initially created to help connect related articles more efficiently. However, a derivative of this system, the Journal Impact Factor (JIF), which ranks journals based on citation data, has had unintended consequences. Originally designed to help librarians decide which journals to subscribe to, the JIF has now influenced where researchers choose to publish, and even what types of research are conducted. Calver and Bryant expressed concern that this system negatively affects studies focused on Australia's unique natural history, as these topics often struggle to gain recognition in prestigious international journals. As a result, important local conservation research may be overlooked. Crowther and his colleagues echoed these concerns, arguing that the reliance on JIFs imposes a corporate mindset on scientific publishing, which distorts research priorities and undermines efforts to protect Australia's biodiversity. They believe that using JIFs to allocate resources, make academic

appointments, and assess research value hinders, rather than helps, the conservation of Australia's ecosystems. In the forum's opening paper, Gordon Grigg shared his reflections on the state of biological and zoological knowledge. He noted that despite advances in these fields, the general public remains significantly uninformed about science, especially biology and evolution. He pointed out that most people encounter science through its technological outputs rather than the processes behind them. Grigg also observed that many get caught up in the logistics of conservation—whether it's writing policies, navigating politics, or handling media relations—at the expense of engaging with new ideas. Grigg also touched on broader issues, such as the difficulty political leaders face in communicating complex scientific topics, like climate change, to the public. He remarked on how poorly equipped many leaders are to explain such issues, in part due to their limited understanding of science itself. Additionally, Grigg highlighted concerns about rising food prices, noting that ecologists see this as a predictable outcome of population growth and competition for space. These examples all point to a larger issue: how science is perceived and understood by the public, and the crucial role science plays in tackling major challenges. For those of us focused on preserving Australia's biological heritage, embracing science and effectively communicating its importance are essential to making progress in conservation.

9. HOW DID THIS MATTER BECOME SO SERIOUS?

Broks (1996) highlighted how misconceptions, language barriers, and oversimplifications made scientists seem distant and disconnected from daily life, fostering stereotypes of them as cold or irrational. This perception, rooted in fears of science as impersonal, has persisted into the 21st century, particularly among those who resist scientific consensus on issues like climate change. Paul Adam examined various aspects of scientific practice and public sentiment in both the UK and Australia, illustrating how mismanagement can put science under threat. Walker (2003a) explored the interplay of science and ideology post-World War II, arguing that political pressures can distort scientific practices, which has lasting effects on how science is perceived. His comparative historical approach offers insights into the political and commercial pressures that can jeopardize scientific integrity. Home (1983) noted a shift in public perception of

science from optimistic views in the early 20th century to skepticism, especially in light of nuclear technology and environmental degradation. He argued for more nuanced discussions about science in education and governance, especially as we face urgent ecological crises. Kitcher (2001) addressed the challenges science faces amid competing ideologies, advocating for a broader understanding of science that aligns with democratic principles. He emphasized the importance of bridging the gap between scientific practice and democratic ideals. Kirk (2007) critiqued the environmental movement's growing hostility toward science, warning that mistrust can hinder effective solutions to ecological challenges. He stressed that while major lifestyle changes are needed, scientific understanding remains crucial for addressing environmental issues. In "Lies, Damned Lies, and Science," Seethaler (2009) examined the role of science in society, arguing that decision-makers often lack scientific expertise and can be misled by those with vested interests. She called for better science education that focuses on interpretation and critical thinking, highlighting the risks of misapplied science when decisions are made by non-experts. Pinker (2006) noted the discomfort surrounding advances in genetics and evolution, emphasizing that science can provoke controversy and opposition. He warned that political leaders may stifle inconvenient research, echoing Hunt's concerns about ideological pressures on scientific inquiry. Rees (2006) recognized the public's ambivalence toward science, warning that fear of losing control could lead to a self-fulfilling prophecy. He advocated for informed public discourse on how science is applied, emphasizing that active engagement is essential to navigate the challenges of rapidly advancing technology. Davies (2006) and Morton (2006) both addressed the urgency of combating climate change, arguing against complacency in the face of environmental crises. Campbell (2006) called for better engagement with the public on scientific issues, noting the need to understand differing perceptions to counter misinformation effectively.

10. LINKING ALL THE CONTRIBUTIONS

A common thread among the discussions on the theme of science under siege is the firm belief that science is essential to our society—not something we can simply dismiss or scoff at. This troubling mindset, which suggests that one can opt out of engaging with science, surfaces in

various issues, from climate change and evolution to the significance of scientific journals and the management of invasive species. It extends to the support and funding of national organizations dedicated to wildlife research and conservation. These anti-science attitudes can emerge from different sources: religious groups that reject scientific principles, philosophical stances that resist the study of animals, or political and commercial agendas prioritizing short-term gains over scientific understanding. These views are not just irritating; they threaten to undermine centuries of scholarly progress achieved through open inquiry and rigorous experimentation. While some of this anti-intellectual sentiment is driven by narrow commercial interests, a more significant concern lies with those who philosophically oppose science, insisting that their worldview is the only valid perspective. Although these issues span various scientific disciplines, our main focus here is zoology, which is currently facing considerable challenges. Working zoologists are under attack, and this situation poses a serious threat to our wildlife. With the alarming rates of extinction exacerbated by invasive species and climate change, Australia risks losing its incredible zoological heritage.

11. CONCLUSION

This review has examined the twin crises facing zoology: the escalating loss of biodiversity and the increasing societal resistance to scientific expertise. Using Australia as a case study, the analysis reveals that zoology plays a central role in addressing environmental degradation, yet it is frequently undermined by political, commercial, and ideological forces. The growing prevalence of invasive species, the impacts of climate change, and the reduction of institutional support have all contributed to the decline of native fauna and the marginalization of zoological research.

Equally concerning is the erosion of public trust in science and the rise of opposition that presents itself under the guise of ethical or philosophical reasoning. While ethical reflection is essential in shaping responsible research, the absolutist views of some groups have led to the obstruction of necessary conservation work. Such positions often fail to account for the complexity of ecological systems and the urgent need for informed intervention.

Despite these setbacks, there remains a strong commitment within the scientific community to

uphold rigorous research and advocate for the preservation of Australia's unique wildlife. The discussions outlined in this paper underscore the need for broader societal engagement with scientific knowledge, improved policy support, and a reassertion of the value of ecological science in public life. If zoology is to continue informing conservation and guiding sustainable environmental management, it must be supported, defended, and integrated into decision-making processes at all levels.

The survival of Australia's wildlife—and indeed, the integrity of science itself—depends on resisting indifference and confronting both ecological and ideological threats with clarity, courage, and purpose.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology.

Details of the AI usage are given below:

1. ChatGPT for assistance in rephrasing literature review content to align with academic writing norms.
2. OpenAI for structuring the methodology section based on secondary data research design.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

Lunney, D. (2012a). Wildlife management and the debate on the ethics of animal use. I. Decisions within a state wildlife agency. *Pacific Conservation Biology*, 18(1), 5–21. <https://doi.org/10.1071/PC120005>

Lunney, D. (2012b). Wildlife management and the debate on the ethics of animal use. II. A challenge for the animal protection movement. *Pacific Conservation Biology*, 18(2), 81–99. <https://doi.org/10.1071/PC120081>

Lunney, D. (2012c). Ethics and Australian mammalogy: Reflections on 15 years

(1991–2006) on an animal ethics committee. *Australian Mammalogy*, 34(1), 1–17. <https://doi.org/10.1071/AM11026>

Lunney, D., & Hutchings, P. (Eds.). (2012). *Wildlife and climate change: Towards robust conservation strategies for Australian fauna*. Mosman, NSW: Royal Zoological Society of NSW.

Anderson E. Animal rights and values of nonhuman life. In: Sunstein CR, Nussbaum MC, editors. *Animal rights: current debates and new directions*. New York: Oxford University Press; 2004. p. 277–98.

Beder S. *Global spin: the corporate assault on environmentalism*. Devon, UK: Green Books; 2002.

Bolton G. *Spoils and spoilers*. North Sydney, NSW: Allen and Unwin; 1981.

Brockman J, editor. *What is your dangerous idea? Today's leading thinkers on the unthinkable*. London: Simon and Schuster; 2006.

Broks P. *Media science before the Great War*. Hampshire, UK: MacMillan; 1996.

Campbell P. Public engagement in science and technology. In: Brockman J, editor. *What is your dangerous idea? Today's leading thinkers on the unthinkable*. London: Simon and Schuster; 2006. p. 225.

Davies PCW. The fight against global warming is lost. In: Brockman J, editor. *What is your dangerous idea? Today's leading thinkers on the unthinkable*. London: Simon and Schuster; 2006. p. 43–4.

DeMello M. Introduction to human-animal studies. In: Engel M, Jenni K, editors. *The philosophy of animal rights: a brief introduction for students and teachers*. Brooklyn, NY: Lantern Books; 2010. p. xi–xxi.

Ehrlich PR, Ehrlich AH. *Betrayal of science and reason: how anti-environmental rhetoric threatens our future*. Washington, DC: Island Press; 1996.

Engel M, Jenni K. *The philosophy of animal rights: a brief introduction for students and teachers*. Brooklyn, NY: Lantern Books; 2010.

Home RW. Preface. In: Home RW, editor. *Science under scrutiny*. Dordrecht: D. Reidel Publishing Company; 1983. p. ix–xvii.

Hunt MM. *The new know-nothings: the political foes of the scientific study of human nature*. New Brunswick, NJ: Transaction

- Publishers, Rutgers – The State University; 1999.
- Kennedy RF Jr. *Crimes against nature: standing up to Bush and the Kyoto killers who are cashing in on our world*. London: Penguin Books; 2004.
- Kirk JTO. *Science and certainty*. Collingwood, Victoria: CSIRO Publishing; 2007.
- Kitcher P. *Science, truth, and democracy*. New York: Oxford University Press; 2001.
- Mooney C. *The Republican war on science*. New York: Basic Books; 2005.
- S. Introduction. In: Brockman J, editor. *What is your dangerous idea? Today's leading thinkers on the unthinkable*. London: Simon and Schuster; 2006. p. xvii–xxviii.
- Rees M. Science may be running out of control. In: Brockman J, editor. *What is your dangerous idea? Today's leading thinkers on the unthinkable*. London: Simon and Schuster; 2006. p. 35–7.
- Saunders D. Chopping forest research: does NSW Government care about science? *The Conversation*. 2011 Aug 22.
- Science Service, editor. *Science news yearbook 1969/1970*. New York: Charles Scribner and Sons; 1969.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of the publisher and/or the editor(s). This publisher and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.

© Copyright (2025): Author(s). The licensee is the journal publisher. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<https://prh.mbimph.com/review-history/4913>