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Special Issue: Addressing Biases in Animal Behaviour

A call for CARE in animal behaviour: an holistic ethical research framework

Gal Badihi [a, b, *], Jennifer Taylor-O'Connor [c], Gabriela Bezerra de Melo Daly [a, d, e], Viola Komeda [a], Sophia Daoudi-Simison [f], Evelina D. Rodrigues [g, h], Michael M. Webster [i], Drew M. Altschul [f], Catherine Hobaiter [a], Charlotte Wiltshire [a], Harmonie Klein [a, j], Elodie Freymann [k], Charlotte Grund [a], Adrian Soldati [l, m], Matthew Henderson [a], Maël M. Leroux [b], Nora E. Slania [n, o]

[a] School of Psychology and Neuroscience, University of St Andrews, St Andrews, U.K.
[b] Cooperative Evolution Lab, German Primate Center, Göttingen, Germany
[c] Parrot Kindergarten Inc., Jupiter, FL, U.S.A.
[d] Federal University of São Paulo (UNIFESP), São Paulo, Brazil
[e] ProMuriqui Institute, São Miguel Arcanjo, Brazil
[f] School of Psychology, Newcastle University, Newcastle upon Tyne, U.K.
[g] Católica Research Centre for Psychological-Family and Social Wellbeing, Universidade Católica Portuguesa, Lisboa, Portugal
[h] William James Center for Research, ISPA—Instituto Universitário, Lisbon, Portugal
[i] School of Biology, University of St Andrews, St. Andrews, U.K.
[j] Ecology of Animal Societies, Max Planck Institute of Animal Behavior, Konstanz, Germany
[k] Institute at Brown for Environment and Society, Brown University, Providence, RI, U.S.A.
[l] Department of Evolutionary Anthropology, University of Zürich, Zürich, Switzerland
[m] Department of Paleontology, University of Zürich, Zürich, Switzerland
[n] Development and Evolution of Cognition Research Group, Max Planck Institute of Animal Behavior, Konstanz, Germany
[o] Department of Comparative Cognition, University of Neuchâtel, Neuchâtel, Switzerland

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Despite increasing awareness of animal welfare, there are vast discrepancies between legal protections and recommended practices for different species, in different countries and at different institutions. While many guidelines are now available, they often target specific research contexts or species, leaving a gap in comprehensive ethical oversight across the entire research process. Within animal behaviour research, there is a bias for considering ethics during only the methodology and design phase. This often means only the immediate impact on animals directly involved in the research is accounted for. Conducting ethical research should extend beyond ensuring animal welfare during data collection and include environmentally sustainable research practices, alongside the ethical treatment of people working within and alongside animal behaviour research. We offer the Consult, Approve, Research and Evaluate (CARE) framework to improve the scientific integrity, transparency and ethical practices within the field of animal behaviour. CARE encourages researchers and academic bodies to (1) Consult existing (academic and traditional) knowledge on the study species, local human–animal interactions, their environment and previously implemented ethical practices and to reflect on personal experience and biases when approaching a study question; (2) seek Approval from relevant bodies (e.g. institutional ethics committees and local and government authorities) even when not mandatory; (3) uphold ethical standards while carrying out Research and (4) Evaluate the short- and long-term impacts of the specific study. Our framework is designed to distribute accountability at every level of the academic system, from individual researchers to their institutions, funding bodies and publishers. We pitch this framework as a 'version 1.0' to recognize the fast-evolving nature of ethical standards in animal behaviour research and to allow space for improvement. CARE provides a necessary infrastructure for addressing systemic biases and ensuring ethically sound, socially responsible and environmentally sustainable animal behaviour research.

* Corresponding author.
E-mail address: gb64@st-andrews.ac.uk (G. Badihi).

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Institutional state measures for improving nonhuman animal (hereafter referred to as animal) welfare are relatively recent in Europe and North America, with early legal recognition marked by the United Kingdom's Martin's Act of 1822. This movement was further formalized through milestones such as the Brambell Report (Brambell, 1965) and its 'Five Freedoms', which include freedom (1) from hunger and thirst, (2) from discomfort, (3) from pain injury or disease, (4) to express normal behaviour and (5) from fear or distress. Since then, the research field of animal welfare grew, and the 'Five Freedoms' have been updated and expanded (Mellor, 2016; Mellor & Beausoleil, 2015). However, human and societal attention directed towards animal welfare predates these developments. For example, the religious belief that ancestors could reincarnate in animal form, which is rooted in the Indus Valley Civilizations up to 3300 BCE, reflects an ethical stance towards animals shaped by spiritual traditions (Szűcs et al., 2012). In the 20th century in 'western' states, an ethical shift in public discourse towards the recognition of nonhuman suffering and the need for establishing animal rights gained momentum with the publication of 'Animal Liberation' (Singer, 1975). This change in perception, alongside scientific advances in our understanding of animal cognitive and emotional capacities, contributed to modern welfare frameworks. For example, the EU's 2010 directive on animal experimentation (Directive 2010/63/EU, 2010) aims to reduce suffering and to improve animal welfare by emphasizing animal sentience and promoting the adoption of the '3Rs' (Replacement, Reduction and Refinement; Russell & Burch, 1959).

While ethical standards related to animal welfare have become more firmly embedded in research protocols, other ethical dimensions of animal research, such as those concerning ethical treatment of people working within animal behaviour research or the establishment of environmentally sustainable research practices, have developed more slowly. Compared with the formalization of animal welfare concerns, considerations related to Equity, Diversity and Inclusion (EDI) have only recently begun to gain traction; for example, increasing awareness of persistent institutional inequalities and hiring biases in science have prompted the formation of EDI committees across institutions. These initiatives aim to address and improve the working conditions of people involved in research of all backgrounds and across academic disciplines. In addition, the growing urgency of environmental crises, such as climate change, biodiversity loss and mass extinction, has further spurred discussions on the responsibilities of researchers to conduct more environmentally sustainable and ecologically conscious research (e.g. '9Rs' framework; Curzer et al., 2013). These broader ethical movements are particularly relevant to the human component in animal behaviour research, which often involves extensive fieldwork, long-term international collaborations and cross-cultural engagement. Integrating EDI and environmental sustainability into the ethical foundations of animal behaviour research can ensure more inclusive, equitable and responsible science for humans conducting it and for the animals being studied (Riley & Bezanson, 2018).

Overall, concerns over (1) animals (the welfare of nonhuman study subjects/participants), (2) humans (the rights of people, including researchers and academic communities, local and national communities and institutional support staff involved in research) and (3) the environment (our responsibility for local ecological impacts and broader contributions to global environmental changes such as carbon footprint and habitat disturbance) have historically been tackled as separate issues and at different stages within animal behaviour research and more broadly within academia (Riley & Bezanson, 2018). We propose an integrated framework that considers ethics across these three dimensions and at each stage of the scientific process. The aims of this framework reflect the One Health approach adopted by the World Health Organization (WHO, 2022), which recognizes the important link between human, animal and ecosystem health for controlling the spread of disease. Connecting these dimensions of ethical science across the research timeline, we introduce the Consult, Approve, Research and Evaluate (CARE) framework to improve scientific integrity (that is, conducting research with honesty, accuracy, transparency and responsibility) and ethical practices in the field of animal behaviour. CARE encourages researchers to (1) Consult existing (academic and traditional) knowledge on the study species, local human–animal interactions, their environment and previously implemented ethical practices and to reflect on their own experience and biases when approaching a study question; (2) seek Approval from relevant bodies (e.g. institutional ethics committees and local and government authorities) even when not mandatory; (3) uphold ethical standards while carrying out Research and (4) Evaluate the short- and long-term impacts of a specific study on animals, humans and the environment. The evaluation stage includes reflecting on the impact of current work to improve future methods and publicly reporting the outcome to allow future researchers to benefit from it during the consultation phase. While some of these practices have been individually introduced or partially adopted, our aim is to provide a clear, adaptable and comprehensive framework applicable across the field of animal behaviour. In addition, through CARE, we offer one of the first explicit integrations of broad-scale environmental consciousness within the ethical practice of animal behaviour research (but see '9Rs'; Curzer et al., 2013). However, the Consult and Evaluate sections remain underdeveloped in current research practice. These sections are critical as they facilitate continuity between research projects conducted in the same area (or with the same study population), reducing redundancy and facilitating the long-term implementation of the Refinement and Reduction aims of the '3Rs'. Ultimately, our goal is that the CARE framework will help to ensure greater consistency, transparency and ethical accountability across animal behaviour studies.

A wide array of ethical guidelines and codes of best practices have been proposed across these three dimensions (animals, humans and the environment), within specific subfields of animal behaviour and more broadly within academia. Although these field-specific guidelines have proven valuable, they are often accessible primarily to researchers working within a particular field; for example, the code of best practice for field primatology (International Primatological Society, 2014) is typically adopted by field primatologists but not by researchers working with other species or with primates outside of fieldwork settings. This compartmentalization can obscure ethical concerns that cut across fields, leading to inconsistent standards and reinforcing discipline-specific siloed norms regarding what constitutes 'ethical' research. In practice, discrepancies in ethical guidelines and practices further exacerbate inconsistencies. For example, laboratory-based research on captive macaques typically undergoes a highly structured ethical review process, whereas field-based studies, including habituation or experimentation on wild chimpanzees, may face minimal oversight or loosely defined ethical expectations. Yet, many ethical concerns arising in captive contexts, such as long-term welfare, exposure to stress or human–animal habituation, are equally relevant across study contexts. Legislation and guidelines for animal welfare vary considerably depending on the country, institution and regulatory framework, with only some researchers operating under stringent ethical review systems such as those enforced by the U.K. Animal Welfare Ethical Review Board (AWERB). Furthermore, there are large

discrepancies between species in the amount of available information, guidance and legally accepted practices for conducting ethical research. For example, among the vertebrates, mammals typically have the most legal protection whereas reptiles and fish have relatively little, and discussions about invertebrate welfare have only recently begun to emerge (e.g. Klobučar & Fisher, 2023). In addition, ethical reviews conducted by an institutional or journal-based ethics committee often prioritize the animal dimension alone, overlooking the impact on human communities and environmental systems. These reviews rarely consider the environmental footprint of fieldwork in remote locations, the potential consequences to local livelihoods (e.g. hiring a small field team on short-term contracts) or the long-term consequences to ecosystems and animal populations once the data collection for a specific study ends.

To address these gaps, we describe how the CARE framework can be comprehensively applied across three dimensions (animals, humans and the environment) and review existing guidelines and biases for each dimension. Moreover, we outline actionable low-cost steps to adopt the CARE framework and improve ethical consistency and integrity in animal behaviour research.

To guide ethical commitments within the CARE framework, we distinguish between obligations and responsibilities. Obligations are the necessary actions we must take for our research to take place. These actions can include securing approval from universities' ethics boards, obtaining national and local authority permissions and providing safe and fair working conditions for everyone involved. Responsibilities are the additional actions we can take that support our ethical goals, including adequate briefing of researchers and field staff about cultural and social expectations; facilitating open and transparent communication; respecting, understanding and integrating local knowledge into research design, methodology and result dissemination (Levis et al., 2024; Riley & Bezanson, 2018). Responsibilities can also include supporting career development and equitable collaboration across people involved in the research. Responsibilities are context specific and dynamic; thus, they should be treated as ongoing iterative processes to be refined in dialogue with the affected parties.

CARE FRAMEWORK

The CARE framework offers an holistic approach to ethics in animal behaviour research, which extends beyond traditional welfare-focused guidelines by considering the rights of people involved and the environmental impact of research. By emphasizing early consultation and postresearch evaluation, CARE encourages ethical reflection throughout the scientific process.

Consult

At the outset of a new project, researchers are encouraged to Consult a wide range of information sources to gain a comprehensive understanding of their study species, their socioecological or institutional context and relevant human–animal interactions. This step goes beyond the standard scientific literature review centred on theoretical background and hypotheses. It involves gathering detailed knowledge about the specific animal population to be studied, whether in the wild, in captivity or under managed care, including their habitat, life or care history, behavioural ecology and any prior research conducted on them. Frameworks such as STRANGE (Social background, Trappability, Rearing history, Acclimation/habituation, Natural changes in responsiveness, Genetic makeup and Experience; Webster & Rutz, 2020) offer valuable tools for evaluating individual variation that may influence research outcomes. In all settings, ranging from field sites to laboratories and zoos, relevant consultation includes the human and environmental dimensions of research. This step involves engaging with the people who work most closely with the animals, such as field assistants, animal care staff, veterinary teams or site managers, as well as considering the values, experiences and knowledge of local communities or institutional stakeholders. These perspectives are vital for designing studies that are not only scientifically sound, but also ethically respectful and practically feasible. Finally, reflecting on the environmental or systemic impacts of the research and exploring low-impact alternatives to mitigate any costs are essential.

Approve

Once a project idea and design are in place, the research should be Approved by an independent or third-party body. While existing ethics committees and other ethical structures provide crucial guidance and oversight in research management, this framework seeks to complement them by tackling dimensions that fall out of their scope or governance. For example, most animal behaviour journals require statements of ethical approval, but the criteria for what constitutes valid approval are not always clear. Some researchers obtain clearance from institutional review boards; others cite government-issued research permits or adherence to published ethical guidelines. Yet, approval structures vary widely across countries, and in many contexts, local councils, rather than national authorities, hold the relevant jurisdiction. Likewise, an essential but frequently overlooked step in ethical practice involves seeking permission from human communities directly impacted by the research. These include field or facility staff, local communities and others with detailed knowledge of the site and animals. Their insights are invaluable in shaping responsible research practices, as neither individual animals nor environments can provide informed consent. Engaging with these affected or involved parties (sometimes referred to as stakeholders) ensures that research is aligned with local expectations and conditions, reduces harm and promotes more collaborative and inclusive science. While we acknowledge that disagreements across different parties, as well as between researchers and other parties, may arise, researchers are advised to pause and reassess rather than circumvent dissent and define on a case-by-case basis the best course of action.

Research

When conducting Research, CARE encourages researchers to apply discipline-specific ethical frameworks that promote best practices within their field, for example, the ASAB Ethical Committee/ABS Animal Care Committee (2025) Guidelines for the ethical treatment of nonhuman animals in behavioural research and teaching or the IPS Code of Best Practices in Field Primatology (International Primatological Society, 2014). Rather than replacing existing frameworks, CARE acknowledges their value and calls for their continued use, adapted to each study's unique context. The research step highlights the importance of tailoring ethical standards to specific methods, settings and study species and drawing on prior consultation and approval processes to guide the responsible implementation of the planned work. Doing so means applying the best practices for the ethical treatment of animals, fostering respectful collaboration with site staff, ensuring a safe and inclusive working environment for researchers and actively reducing environmental footprints, such as avoiding habitat degradation, responsibly managing research waste (e.g. used equipment or batteries) and limiting carbon emissions.

Table 1
How to CARE about each dimension of animal behaviour research

	Reasons and ways to adopt and use the CARE framework
Animals	
Consult	1. Understand relevant laws surrounding animal welfare and rights in the country hosting data collection and the country of the researchers' home institution, particularly when working across international borders. The animal protection index (https://api.worldanimalprotection.org/) is a useful resource for identifying differences in animal rights across countries. In addition, Bayne and Turner (2019) provide a framework for harmonizing welfare standards across international collaborations. Furthermore, Suzuki (2021) notes the existence of a rich diversity of care practices in specific cultural and institutional settings.*** 2. Familiarize ourselves with the study population, including individual animals' histories, traits and potential responses to research protocols. Examples of useful guides are the STRANGE framework (Webster & Rutz, 2020), which assesses sampling biases, and the Ape research index (https://sites.google.com/view/ape-research-index/home?authuser=0), which analyses the outcomes of involvement in research studies. 3. Establish behavioural baseline (e.g. feeding habits and social interactions) and, where possible, physiological indicators (e.g. hormone levels) to assess stress and wellbeing before, during and after the study. 4. When working in zoos or captive facilities, researchers should consult regional and international species management programmes, which provide valuable, species-specific information on husbandry, behavioural needs and welfare standards. In Europe, the European Endangered species Programme offers detailed guidance on housing and care practices (European Association of Zoos and Aquaria, 2025). Equivalent programmes include the species Survival Plan (Association of Zoos and Aquariums, 2024) in North America and the Australasian species management program under the Zoo and Aquarium Association Australasia (2025). These documents are excellent resources for aligning research with best practices in captive animal care.***
Approve	1. Researchers should seek independent ethical review from committees with expertise in the specific taxa, context (captive/wild) and methodology used. Ideally, a reviewer should have prior knowledge of the study site or animals.*** 2. Where institutional boards are lacking, independent panels (e.g. through CARE-affiliated working groups) could fill this gap, ensuring consistent standards across fields and settings. An alternative approach involves partnering with researchers based at institutions equipped with institutional review boards.
Research	1. Apply established ethical frameworks and tailor protocols to the needs of individual animals and populations. Examples of established ethical frameworks are the NC3Rs, which focuses on replacement, reduction and refinement (NC3Rs, 2025); the ASAB/ABS guidelines, which emphasize legal compliance, animal welfare and the 3Rs; and the International Union for Conservation of Nature (2025) protocols, which provide a suite of frameworks oriented towards conservation.*** 2. Consider the animal's agency. Enable voluntary participation when possible (e.g. in captive settings); minimize disruptions in captive and wild settings and pay close attention to behavioural cues of stress or withdrawal (Fenton, 2014); for a review of what 'volunteering' means, see A. Palmer et al. (2023). 3. Where appropriate, align research procedures with welfare benefits: For example, use enrichment-based experiments; ensure handling is minimal and justified, and consider long-term benefits when using invasive methods. Ideally, research should contribute positively to the animals' lives, either directly (through enrichment or veterinary feedback) or indirectly (through improved species management or welfare knowledge).
Evaluate	1. Researchers should ideally conduct long-term monitoring of study populations, including physiological indicators (e.g. hormone levels and health markers) and behavioural measures (e.g. return to baseline social or activity patterns). 2. Evaluation should assess not only the focal individuals but also the broader group, species and ecological community that may have been affected. 3. In many countries, ethics committees already require a postprocedure evaluation, including a re-estimation of the true severity of the procedures actually carried out, in comparison with the initial projection. This process is a critical step for improving transparency and future research planning.*** 4. We encourage journals to require the inclusion of this postevaluation process in ethical reporting and for authors to publish these evaluations, whether as part of the main article or in supplementary materials. Sharing these outcomes promotes accountability and provides valuable reference points for future projects. 5. Evaluation results should feed back into the consultation phase of future research, thereby closing the research ethics cycle and promoting continual improvement.
Humans	
Consult	1. Identify all groups and individuals affected directly or indirectly by the research, from institutional partners and local communities to each team member. This step means identifying those who have a stake in the project, have power to influence outcomes or may be affected directly or indirectly over time (Bryson, 2004). 2. Pay special attention to how inequalities may differentially affect individuals (e.g. local farmers impacted by crop raiding or LGBTQ+ researchers working in hostile legal contexts). Recognize that the experience of seeking other parties' approval might vary depending on whether the research takes place in a well-established field site, a zoo or a more remote location. 3. Familiarize ourselves with local laws, religions, cultural practices and community histories (e.g. primates regarded as kin or sacred beings in some cultures).*** 4. Understand how local communities depend on the study species or environment, for example, whether they rely on the same habitat for farming, foraging or fishing or whether the study species are considered pests (e.g. crop raiders or livestock predators) or a source of food. These dynamics can shape human–wildlife interactions and local attitudes towards conservation. Research should aim to avoid exacerbating tensions and instead identify opportunities to support community livelihoods and promote coexistence. 5. Consult not only with scientists, but also with local leaders, field assistants, farmers, herders and other involved parties to ensure that research questions and practices are developed with, not just about, the people most affected.
Approve	1. Obtain all necessary permits from governmental and institutional bodies.*** 2. Seek approval from communities and rights holders through respectful engagement (e.g. meetings with elders and town councils). 3. Confirm ethical approval from the management teams of field sites, zoos or sanctuaries. 4. Treat local and community consent as ongoing, not a one-time event, to ensure continued communication and the ability to opt out. 5. In studies involving indigenous or traditional communities as research participants (e.g. in ethnoprimatology), additional local and international legislation usually applies (e.g. FPIC; FAO, 2016) and CARE principles for indigenous data governance (Global Indigenous Data Alliance, 2025; Jennings et al., 2023).
Research	1. Actively diversify research practices by involving local collaborators as co-authors, co-designers and recognized knowledge holders (Sabin, 2024). 2. Follow EDI guidelines from societies and journals (e.g. Setchell et al., 2025; Setchell & Gordon, 2018), and avoid tokenistic inclusion, that is, including underrepresented people without meaningful engagement (see Hobaiter et al., 2021 for a critique). 3. Build and provide support systems for researchers, especially early-career scientists and those working abroad for the first time (e.g. mentorship or buddy systems). Researchers working in politically unstable or high-risk regions (e.g. with conflict, disease exposure or harsh environments) should undergo risk training and ensure appropriate safety protocols are in place (emergency contacts, exit strategies, etc.; Rudzki et al., 2022).

Table 1 (*continued*)

	Reasons and ways to adopt and use the CARE framework
	4. Ensure the research also supports local goals, whether that means balancing conservation policies with local lifestyles (Matsuura et al., 2013), building educational capacity (Ikhuluru et al., 2023) or questioning western views of nature and animals (Descola, 2014). 5. Ensure fair pay and working conditions for all field assistants, translators and logistical support staff. Consider long-term employment opportunities or training as part of your project. 6. Respect data sovereignty: Biological samples, recordings or behavioural data sets should not be removed, analysed or published without agreement. Check whether national or institutional laws apply. In particular, we encourage researchers and institutions to uphold the principles of the Nagoya protocol on access and benefit sharing (Secretariat of the Convention on Biological Diversity, 2011). 7. Offer training in research methods, data analysis or scientific writing to students and collaborators at the research site. Include them in grant proposals and conference participation when possible.
Evaluate	1. Monitor the long-term impact of your presence and project on local people. Did the research create burdens or benefits? Did it alter human−animal relations? Were local collaborators recognized and acknowledged? 2. Promote equity by sharing data, results and benefits with local partners in local languages and accessible formats. 3. Maintain relationships with collaborators and communities even after the project ends. These long-term ties support future work and improve monitoring of human and animal welfare. 4. Foster enduring knowledge exchange and conservation outcomes by recognizing and integrating indigenous and relational worldviews (Levis et al., 2024). 5. Proactively counter systemic inequities, such as unequal access to training, data or publishing platforms. Help collaborators apply for grants, co-present at conferences and co-develop future research. 6. Ensure transparent reporting of approval and outcomes: Journals should encourage reporting not only of initial community approvals but also how consent, benefit sharing, and local engagement were evaluated throughout the project.
Environment	
Consult	1. Assess what is already available: Before initiating new data collection, consult with collaborators to determine whether sufficient data or samples already exist. Doing so reduces unnecessary environmental disturbance and duplication. 2. Consult environmental authorities: In addition to ethical and scientific review, researchers should seek input from relevant local, national or international environmental agencies about the potential ecological impact of their project. 3. Minimize travel where possible: Prioritize carbon-efficient options, such as local field sites, public transport or consolidating trips into fewer, longer periods. In some cases, remote collaboration or data sharing may be a better alternative to travel altogether. This concern includes dissemination of research, in particular, conferences, which can offset environmental burden by hybrid or online formats while supporting researchers who face financial and visa/barrier to enter countries (Animal Behaviour Live, 2025). 4. Engage with local communities: Incorporate local and indigenous environmental knowledge to guide context-specific and ecologically appropriate practices. When local voices shape environmental decisions, outcomes are often more equitable and sustainable.
Approve	1. Secure approval from relevant regulatory, institutional and community authorities. 2. Encourage institutional accountability: ethics committees, funding agencies and journals should be encouraged to include environmental impact assessments as a standard part of research review and reporting (e.g. by integrating this into ethics statements or application processes).
Research	1. Follow conservation principles: Apply field ethics such as ; Leave No Trace, 2025; Marion & Reid, 2001) and follow expanded frameworks that acknowledge ecological as well as animal welfare impacts (e.g. the 9Rs; Curzer et al., 2013). 2. Use environmentally responsible materials and methods: Choose biodegradable and noninvasive tools; reduce noise and light pollution; select observation points that minimize habitat disruption and avoid repeated visits to ecologically sensitive areas (e.g. when appropriate, deploy camera traps instead of focal follows). 3. Handle waste responsibly: Recycle materials whenever possible, or transport waste to areas with proper disposal facilities. Never leave nonbiodegradable waste at research sites nor in surrounding local areas without proper waste treatment facilities. 4. Reduce equipment waste by sharing and reusing: Avoid purchasing new equipment when existing tools can be borrowed, shared or repurposed within your institution or between collaborators. Avoid purchasing hazardous equipment when alternatives are possible (e.g. rechargeable versus nonrechargeable batteries). Establishing shared inventories, research equipment pools or local lending agreements between field sites and research teams can encourage a culture of collaboration and sustainability. This practice also promotes equity by improving access to expensive technologies for under-resourced teams or institutions. 5. Offset unavoidable impacts: If activities (e.g. international flights) result in high emissions, consider offsetting their impact by supporting reforestation efforts, habitat restoration projects or carbon credit schemes equivalent to the cost or emissions generated.
Evaluate	1. Monitor ecosystem changes: Environmental variables such as temperature, rainfall, tree phenology and biodiversity of nonfocal species should be recorded regularly, in collaboration with local researchers. These variables can form part of long-term ecological monitoring programmes that extend beyond the duration of any single research project. 2. Support resilience and restoration: evaluation should include not only measurement of environmental impact but also efforts to mitigate harm and support ecological resilience. This process may include habitat restoration or contributing to community-led conservation.

This table provides examples of actions that can be taken at each stage of research to promote ethical practices that benefit or improve conditions for the animals, humans and environments affected by scientific study. Sections highlighted with '***' represent obligations that are currently recognized (at least within some regions/contexts). FPIC: free, prior and informed consent; EDI: equity, diversity and inclusion.

Ethical research also involves ongoing communication with human partners to address concerns and adapt protocols to evolving conditions and addressing the wellbeing of people and ecosystems throughout the project.

Evaluate

The ethical considerations of any research project do not end once data collection is complete. Furthermore, many research projects are carried out over many years and across multiple generations of animal participants. CARE encourages researchers to Evaluate the immediate and long-term impact of their project during it and after its completion. Evaluation includes the impacts on individual animals and their social groups, the broader ecosystem (including other species) and a global perspective (e.g. carbon footprint linked to travel or equipment). It also includes effects on human communities and research collaborators. Evaluation should be transparent and, where possible, made publicly accessible. To feel confident and comfortable in doing so, researchers need a mechanism by which errors can be acknowledged without judgement and seen as opportunities to learn from. Doing so enables future researchers to integrate previous assessments into their own consultation phases, supporting cumulative ethical reflection and improved practices

across time. Consequently, this step promotes a continuous cycle of ethical reflection that benefits animals, people and the environment.

WHY SHOULD WE CARE?

In the following sections, we outline the reasons and ways (Table 1) to adopt and use the CARE framework within the three dimensions: animals, humans and the environment. Each dimension requires slightly different considerations at each stage of research, although some are overlapping and ultimately related to one another.

Animals

Scientific and legal advances in animal welfare have been largely driven by the recognition that nonhuman animals can suffer in ways comparable to humans. This recognition and legislative shift, which initially focused on species whose pain expression and physiology closely mirror our own, such as vertebrates, has led to widely adopted welfare frameworks such as the Five Freedoms (Mellor & Beausoleil, 2015; Mellor et al., 2020). More recently, evidence of complex cognition in species such as octopuses has prompted their inclusion in legal protection in some countries (Commission Delegated Directive (EU) 2024/1262 of 13 March 2024 Amending Directive 2010/63/EU of the European Parliament and of the Council as Regards the Requirements for Establishments and for the Care and Accommodation of Animals and as Regards the Methods of Killing Animals, 2024). The adoption of 'minimal concepts' and 'multidimensional' approaches to animal behaviour, which acknowledge the variety of ways in which behaviour can be expressed across individuals and species (e.g. Andrews & Monsó, 2025), can improve our ability to recognize negative and positive experiences in nonhumans and adjust our study and handling methods accordingly.

The growing Positive Animal Welfare (PAW) movement builds on these advances by arguing that reducing suffering is not enough: research should also promote positive experiences and support animals' capacity to thrive, particularly in captive environments (Rault et al., 2025). Captive studies, including 'invasive' biomedical research and 'noninvasive' behavioural experiments, can significantly affect the wellbeing of animals, and captivity itself may alter natural physiology and behaviour, which may impact both thresholds for the ethical justification of such research and the validity of the findings (Johnson et al., 2024).

Prior evaluations of animal research, particularly laboratory-based and biomedical research, have weighed the cost of animal suffering against the potential benefits to humans (e.g. the development of life-saving medicine). However, the CARE framework does not prioritize any of the dimensions (that is, animals, humans or the environment) over another; therefore, the potential benefits to humans should not be used in isolation to justify nonhuman suffering within a research setting. Instead, CARE strives to extend the Three Pillars (Harmonization, Replacement and Justice) of ethical research proposed for nonhuman primates (Johnson et al., 2024) to all species, while recognizing that species differences in physiology, cognition and behaviour should inform different research practices and ethical guidelines. These Three Pillars (Johnson et al., 2024) call for guidelines for animal treatment to align with the guidelines provided for the ethical treatment of human participants (Harmonize), for the replacement of sentient creatures with alternative models wherever possible (Replacement) and for safeguards against the exploitation of research subjects/participants (Justice) as first applied in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979) to ensure the just treatment of human subjects.

In parallel, the field of wild animal welfare is expanding in response to increasing anthropogenic pressures to understand and improve the quality of life of animals in natural settings (e.g. Wild Animal Initiative, https://www.wildanimalinitiative.org). This research not only promotes conservation, research and wildlife management, but also enhances welfare practices for captive individuals. Although existing legislation often focuses on species or population-level protections, growing empirical evidence shows that individual variation, including personality, genetics and social background, can significantly affect welfare and scientific outcomes. Therefore, ethical research practices should take such differences into account throughout the research cycle (Webster & Rutz, 2020). Through the CARE framework, we advocate for an holistic view of animal wellbeing in science, one that goes beyond refining study design or sampling and instead embeds the PAW principles throughout the research cycle, in captive settings and in the wild. We recognize that, in some cases, the application of the CARE framework may render some study designs 'unjust' or 'unethical', where they provide no benefits to the animal subjects or participants.

Humans

Animal behaviour research is a deeply human endeavour, shaped by the actions, perspectives and lived experiences of diverse individuals and communities (e.g. Bournois & Chevalier, 1998). Yet, being a discipline anchored in fieldwork across the world, animal behaviour research has long been entangled with extractive, colonial practices (Heise, 2024; Nsah, 2023). In many international collaborations, researchers from more affluent global regions extract data and raw materials (e.g. biological samples) from low- or middle-income countries and analyse them in their home nations sometimes without securing appropriate permission or recognizing the contributions of local communities and collaborators (Setchell et al., 2025). These dynamics are further entrenched by Eurocentrism (Bueno et al., 2024; Fals-Borda & Mora-Osejo, 2003; Fuentes, 2011), WEIRD-centrism (Andrews & Monsó, 2025), the dominance of English as the language of science (Politzer-Ahles et al., 2020) and persistent global inequalities in access to training, funding and publishing opportunities. Furthermore, not all researchers can safely or equally engage in fieldwork: LGBTQ+ researchers may face legal or personal threats in some countries (Cheyne, 2019), and research activities may unintentionally endanger or alienate human communities living alongside the studied species. CARE encourages researchers to engage ethically with these communities, valuing their knowledge systems (e.g. Perspectives Collective; https://www.perspectivescollectivejournal.com), listening to their concerns and ensuring that conservation or research efforts do not undermine their wellbeing or autonomy (Vaughn & Jacquez, 2020).

Beyond fieldwork, academic institutions also reflect systemic biases that limit participation and discourage diversity of thought. People with marginalized ways of thinking and being, whether due to disability, race, ethnicity, gender or caregiving responsibilities, often face systemic or institutional discrimination and structural barriers to success (Chasen et al., 2024; Cronin et al., 2021; Dupree & Boykin, 2021; Lindsay & Fuentes, 2022; Staniscuaski et al., 2023; Zheng et al., 2022). In addition, academia continues to privilege neurotypical researchers, whose neurological and cognitive functioning aligns with institutional norms (Quigley et al., 2024). CARE advocates for a more inclusive research culture, one that recognizes the value of intellectual and experiential diversity not only as a matter of fairness, but also as a driver

of scientific progress, thereby opening the door to new ideas and methodology.

Embracing diverse perspectives enhances the rigour, creativity and societal relevance of animal behaviour science, leading to more robust and ethical research practices. Using such a multi-baseline approach recognizes diverse perspectives and cognitions (both human and nonhuman) equally rather than taking WEIRD- or Euro-centric methods as the 'gold standard' (Andrews & Monsó, 2025). CARE also encourages researchers and institutions to ensure that these principles extend to the selection, support and recognition of researchers at all career stages, including students and staff from underrepresented groups. Structural inequalities within academia shape who can participate in animal behaviour research, and CARE aims to foster a more inclusive and supportive academic culture.

Environment

Practising CARE at the environmental level requires us to recognize that our actions extend far beyond the animals we study. Such actions influence, and are influenced by, complex socio-ecological environmental systems that may not be immediately visible to us. While animal behaviour research is inherently linked to the environments in which our study species live (whether 'natural' or anthropogenic), efforts to actively mitigate environmental impact have remained limited.

At the local level, our presence and practices directly impact the ecosystems that we study and live in, which may disrupt long-term ecological dynamics and contribute to habitat degradation, pollution or biodiversity loss (Palmer et al., 2014). These effects can be minimized through careful planning, which includes avoiding harmful materials and methods, supporting conservation and pro-environmental efforts (such as selecting recycled materials or less resource-consuming equipment and integrating sustainable waste treatment) and prioritizing the restoration of affected ecosystems.

At the global level, indirect environmental impacts, such as those associated with travel to research locations and conferences, can be significant. We propose a 'minimal environmental impact' mindset, a 'less is more' approach that emphasizes restraint and ecological mindfulness throughout all stages of the research process. For example, prioritizing the use of extant data sets, sharing data where possible and carefully considering the necessity of collecting new data to answer new research questions could reduce the carbon impact of new projects. Doing so can protect not only study species, but also their broader habitat, communities residing in these locations and the global climate.

In addition to field-based work, research conducted in captive settings (including zoos, sanctuaries and laboratories) also contributes to environmental impact, although these effects are typically overlooked. Captive facilities can generate substantial energy consumption, waste and resource use (e.g. water, heating and imported food) and may result in substantial ecological footprints through land use and infrastructure development. The animals used for laboratory research, as well as the equipment and food used to house them, are regularly transported long distances, resulting in further carbon emissions. Moreover, some animals, such as nonhuman primates used for biomedical research, are still regularly taken from wild populations, which can destabilize populations and ecosystems at a larger scale (Badihi et al., 2024). Researchers and institutions should explore sustainable alternatives, such as facility sharing or reducing reliance on energy-intensive housing systems, and incorporate ecological responsibility into procurement and infrastructure decisions. CARE encourages the critical assessment and reduction of these impacts through sustainable facility management and resource minimization.

Finally, reducing carbon footprints also requires a systemic shift at a higher level; for example, larger academic bodies can reduce travel by offering virtual conferences or conference hublets (Raby et al., 2022), which not only offer low-carbon attendance but also makes conference attendance accessible to more people who may not have the resources to travel long distances. Small decisions, when consistently applied, can lead to meaningful change and any positive action, even where potentially small, is better than none and can scale dramatically when adopted across research groups and institutions.

CONCRETE STEPS AND IMPLEMENTATION OF FRAMEWORK

The CARE framework is a light-touch tool to support and guide ethical dialogue and practice in animal behaviour research involving wild and captive animals. In developing CARE, our intention is that participation in the framework should not be burdensome. Engaging with any parts of the tool not already being implemented in a research project could contribute positively to the animals, humans and environments with which we work. CARE is intentionally designed to be adaptable, allowing small- or large-scale changes in practices, guidelines and ethical standards that can evolve as the landscapes in which they occur change. For example, we recognize that animal behaviour fieldwork, as well as western nationalities, WEIRD and European backgrounds and the use of the English language, is over-represented in the current authors of CARE v1.0. To improve and ensure that the framework evolves in response to community needs, we welcome feedback and new contributors, and we are committed to publishing CARE v2.0 in which we will report on the successes and limitations of the framework.

A key output of this initiative is the creation of an open-access online database that consolidates existing ethical guidelines across the three CARE dimensions: animals, humans environment. Researchers can access, contribute to and build on this repository to support ethical decision making in their own projects. Although our working group will monitor new entries, the database is designed to be a community-driven, open-source resource. The first template of this tool is available at care4research.org. We aim to grow this space and our community online and through public engagement (e.g. via workshops and conference talks) to facilitate open discussion about ways to improve ethics in animal behaviour research.

CARE emphasizes individual responsibility (e.g. through research design) and collective responsibility (e.g. towards creating inclusive work environments), as well as systemic change (that is, institutional and organizational). Ethical awareness should begin early during a researcher's training, and can be encouraged by supervisors, institutions, societies, funding bodies, journals and permitting agencies. For example, the CARE framework can be incorporated into undergraduate and graduate curricula in relevant disciplines and introduced to volunteers, research assistants and researchers ahead of fieldwork and research stays. Ethics committees and research facilities can also use CARE as a reference to guide their own approval processes and as a resource to share with prospective researchers. In addition, the use of CARE can expand ethical thinking beyond animal welfare to include working conditions for humans and broader issues of equity and decolonization in science; CARE is also suitable for integration into other EDI initiatives and into the official guidelines of animal societies.

Given that research is evaluated, made visible and publicly accessed through journals, the systematic integration of the CARE

framework in the publishing process would catalyse field-wide progress towards more ethical animal research. Achieving this integration might involve (1) a voluntary Opt-In badge system, similar to those used for Open Science practices, or (2) the incorporation of CARE into journal guidelines, as with the STRANGE framework and ASAB/ABS's ethical guidelines (Rutz & Webster, 2021). The incorporation of (3) a standalone ethics statement separate from the main text of articles could also allow for more detailed and transparent reporting of ethical considerations and the challenges encountered in implementation and could suggest solutions. Moreover, (4) journals could be assessed independently to evaluate the general ethical standards of the papers published and provide an index score that corresponds to the ethical standards of the recently published literature. Such an evaluation also holds the journals that benefit from animal behaviour research accountable for publishing high-quality and highly ethical papers. Finally, CARE may be included into (5) funding applications and register reports, allowing reviewers to provide suggestions at the planning stage and help ensure that the necessary resources are properly budgeted. We recognize that the adoption of the CARE framework will take time and face challenges. However, we hope that its current form offers individual researchers and their institutions an actionable light-touch starting point. Researchers at all career stages can begin applying the framework to their own projects, sharing it with colleagues and students alike.

Conclusion

The CARE framework offers a new integrative approach to ethics in animal behaviour research by simultaneously addressing three interconnected dimensions: animals, humans and the environment. Compared with existing guidelines, which largely focus on the welfare of study animals during data collection, CARE expands ethical consideration to include the rights and wellbeing of people involved (researchers, local communities and field staff) and the ecological and environmental impacts of research activities. CARE also emphasizes two critical but often neglected phases: Consultation before research begins and Evaluation after data collection concludes. This holistic approach fosters ethically sound, socially responsible and environmentally sustainable research throughout the scientific process. We recognize, however, that the CARE framework is a starting point rather than a finalized ethical blueprint. In this first version, some areas, such as the ethical tensions surrounding research in captive settings, the broader validity of data from such contexts and the environmental footprint of laboratory research, are not fully addressed. We see this as a call for future elaboration, debate and refinement. In the spirit of CARE itself, we encourage our community to critically engage with these challenges and to continue shaping the framework into a more inclusive, reflexive and responsive tool for ethical research.

Author Contributions

Gal Badihi: Writing – review & editing, Writing – original draft, Supervision, Resources, Project administration, Methodology, Investigation, Conceptualization. **Jennifer Taylor-O'Connor:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Gabriela Bezerra de Melo Daly:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Viola Komeda:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Sophia Daoudi-Simison:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Evelina D. Rodrigues:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Michael M. Webster:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Drew M. Altschul:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Catherine Hobaiter:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Charlotte Wiltshire:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Harmonie Klein:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Elodie Freymann:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Charlotte Grund:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Adrian Soldati:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Matthew Henderson:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Maël M. Leroux:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization. **Nora E. Slania:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Conceptualization.

Data Availability

This study is not based on any new or pre-existing data.

Inclusion and Diversity

Our study included scientists based in different institutions from around the world and is composed of a mixed gender team. Our authors represent a diversity of career stages within academia from Masters students to Professors (and everything in between).

Declaration of Interest

The authors declare no conflicts of interest.

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