

LONG-TERM WELFARE VS. SHORT-TERM HARM: A MORAL EVALUATION OF TRACKING AND EUTHANASIA IN CONSERVATION OUTCOMES

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Abstract

Purpose: *The purpose of this paper is to critically examine the moral justification of wildlife tracking and euthanasia by assessing the tension between harm to individual animals and the perceived benefits to broader ecological systems.*

Design/Methodology/Approach: *The study adopts a qualitative philosophical and analytical research design, relying on critical textual analysis of established ethical theories, including utilitarianism, deontology, virtue ethics, biocentrism, and ecocentrism, as interpretive frameworks for evaluating conservation practices.*

Findings: *The findings reveal that while wildlife tracking technologies contribute significantly to ecological monitoring, species protection, and biodiversity management, they may also impose stress, injury, and behavioural disruption on animals, raising serious ethical concerns. Similarly, euthanasia practices used in invasive species control and population management present enduring moral conflicts between safeguarding individual animal welfare and achieving long-term ecological balance. The study further finds that no single ethical framework adequately resolves these tensions, as each offers valuable insights but also significant limitations when applied to real-world conservation dilemmas.*

Research Limitations/Implications: *The research is limited to normative ethical analysis and does not incorporate empirical field data, yet it provides important implications for wildlife management policies, conservation ethics committees, and environmental decision-making processes.*

Originality/Value: *The originality and value of the study lie in its integrative pluralistic ethical framework, which emphasizes proportionality, precaution, compassion, and practical wisdom as guiding principles for balancing scientific conservation goals with moral responsibility toward non-human life.*

Keywords: *Animal rights; Biodiversity; Ecocentrism; Environmental ethics; Humane intervention; Species preservation; Utilitarianism; Virtue ethics*

1. INTRODUCTION

Managing wildlife in the twenty-first century has evolved to be more complex as man activities put greater pressures on the ecosystems and animal populations than ever before. The effects of climate change, habitat disintegration, poaching and growth of urban areas have compelled wildlife managers and researchers to design rules geared towards monitoring, protecting and in some instances, regulating the population of animals. Some of the most conspicuous of these activities include tagging and tracking, the capture and marking of wild animals either to track population, study behaviour or to evaluate a habitat, and euthanasia, which is often employed in response to injury, disease or population management requirements. On the one hand, the practices are justified as the necessary measures to protect the long-term ecological stability and biodiversity; still, they cause serious ethical issues due to the direct damage, pain, and death of individual animals (Bekoff, 2019; Palmer, 2020).

Tagging and tracking e.g. radio-collaring, implanting GPS or banding. Even though such interventions are important in the generation of scientific knowledge, they may lead to stress, injury, and long-term behavioural disruption in animals (Wilson & McMahon, 2006). Euthanasia, on the other hand, is used when a given animal is irretrievably damaged, when invasive species are to be eradicated to maintain biodiversity of the native ecosystem, or when ecosystems are at risk of overpopulation. Although most of the time the euthanasia is justified as a mercy or as a necessity to preserve our ecology, it is yet ethically controversial since it entails the intentional killing of animals (Tomasula et. al., 2023). Combined, these practices summarise one major ethical quandary: to what degree can the short-term welfare of individual animals be sacrificed with the aim of achieving long-term conservation results?

It is a dilemma which stands at cross purposes in the conflict of ethical commitments. On the one hand, conservation biology frequently values collective goods to the preservation of species, ecosystem well-being and biodiversity. In its turn, animal welfare ethics demands the moral respect of the personal suffering, independence, and life. The tension between the two views is not easily solved since one side tends to be privileged at the expense of the other (Paquet and Darimont, 2010). To illustrate, placing tracking devices could help in conservation of an endangered species habitat, but the animals carrying the tracking device can be subjected to extended suffering. On the same note, the act of euthanising invasive species to protect an ecosystem is good as it protects the lives of sentient beings.

This paper is an attempt to assess this tension in a philosophical perspective by asking whether the short term ills involved with tagging, tracking and euthanasia can be morally justified by the long term conservation advantages. Through interaction with utilitarian reasoning, ethics, and virtue ethics, the discussion is aimed at evaluating the legitimacy of such trade-offs, but also by considering the wider problem of moral standing, that is, whether ethical concern ought to be focused on individual animals,

populations, or ecosystems. By so doing the paper is added to a growing debate that requires a more holistic method of ethics in wildlife management that would consider the seriousness of immediate suffering and yet would be mindful of the ecological demands of conservation (Zemanova, 2020).

2. LITERATURE REVIEW

2.1 Defining “Welfare” in Wildlife Contexts

The concept of welfare in the wildlife setting is a highly controversial one, mostly due to the necessity to operate on the fringes of the biological well-being, subjective experience, and normative ethics. Welfare has been used in animal ethics to refer to the ability of an individual to have positive and negative experiences as pleasure, pain, comfort or distress (Fraser, 2008). The sentientist view stresses that animals are not just passive parts of ecosystems, but rather subjects of experience whose well being has moral value. Operationalised in a pragmatic or population-scale sense in wildlife management, however, it is often operationalised to address survival, reproduction, and ecological purpose instead of the lived experience of people (Ramp & Bekoff, 2015). This departure brings to light a philosophical conflict: does welfare in conservation discourse have a narrow meaning, in terms of individual sentient beings, or a broader meaning in terms of ecological systems?

The individual-centred approach is philosophically appealing to both the rights-based and utilitarian ethics. To illustrate, Singer (2013), who is a utilitarian, would contend that the wellbeing of individual animals, which is defined as the ratio of pain to pleasure, has to be considered when gauging conservation activities. A theorist, like Regan (2017), who holds the view of rights-based theory would go to the extent of proposing that welfare could be seen as safeguarding inviolable rights, including the right not to be subjected to unnecessary harm. In opposition to this, ecological holists like Callicott (1989) suggest that welfare can never be narrowed down to the sensations of individuals; instead the integrity, stability and beauty of the biotic community as a whole should be the subject of moral interest. This ecological explanation of welfare creates a serious philosophical complication, in the sense that it can rationalise acts that cause damage to individuals provided they contribute to the prosperity of the entire ecosystem.

In the context of research and management in the field of wildlife, these opposing conceptions of welfare cause conflicting priorities in practice. As an example, in the case of an individual-centred conception of welfare, when wild animals are tagged or collared, people would be alarmed of the stress, injury, or change in behaviour that the animal has undergone. Such momentary misery may be justified as an ecological conception though the information that is obtained is used to maintain the survival of the species in the long run. These discrepancies highlight the statement that welfare is not a neutral notion but rather, an entity that entrenches ethical promises in terms of what ultimately matters in the moral judgment of the human-animal interactions (Palmer and Sandoe, 2021). In this paper, the

welfare will be considered as a broad concept that will include the sentient experiences of particular animals and the ecological conditions that support their existence in this world, as well as critically questioning the trade-offs between the two dimensions.

2.2 Short-Term Harm vs. Long-Term Outcomes

Among the main ethical issues of the wildlife research and management, there is the issue of justification of present harms in the name of the future benefit. Capture, sedation, tagging, or euthanasia are common practices which tend to be justified through an appeal to the concept of temporary suffering compensated by long-term conservation benefits, such as species protection or ecological stability, and protection of biodiversity (Paquet and Darimont, 2010). In philosophical terms, this conflict can be put into the framework of the consequentialist logic: once the total good in terms of the environmental balance or the survival of a specific population group is higher than the evils that individuals may suffer, then said practices may be deemed morally acceptable. However, such calculus is not quite easy as it provokes hard questions concerning whose well-being matters and how to balance incommensurable values, including individual torment and eco-system wellness.

One way of solving this dilemma is via utilitarian views. According to a utilitarian, it is possible to say that when the pain of tagging a few people results in a scientific advancement that will save the lives of a group of people, then the action will be morally justifiable (Singer, 2013). Such reason has however been criticised as having a tendency to make individual animals to be seen as a dispensable instrument to the end of the group (Regan, 2017). The rights-based theories challenge this logic and state that people have moral claims which cannot be outweighed by references to aggregate welfare. In this perspective, the act of removing invasive species or placing painful tracking apparatus, despite be effective to the whole ecological order, would be unethical to the inherent right of individual animals and therefore would not be morally justified (Francione, 2008).

The virtue ethics provides another point of view and relocates the emphasis off of the results or rights, instead, placing it on the moral character of human agents (Towolawi, 2026). In this perspective, the moral inquiry is not on whether the harms are in the disproportion of the benefits, but whether the practices like euthanasia or tracking are virtues such as compassion, humility and respect of animals (Hursthouse, 2011). This model underlines the danger of moral desensitisation when being a conservationist, and through the act of causing repeated harm in the name of the greater good, one may become desensitised to the virtues one should have to live a humane relationship with wildlife.

Also, the consideration of the temporal aspect makes the ethical calculus more complicated. Short-term damages are tangible, instantaneous, and definite, whereas long-term consequences tend to be hypothetical and prone to ecological, political and social influences. To develop an example, the elimination of invasive species still cannot ensure ecological stability when other anthropogenic pressures are still present (Tomasula et. al., 2023). It therefore follows that, using long-term

consequences as the basis of justification of current evils exposes an individual to moral fallacy in the event that such consequences do not translate into reality. It implies that a precautionary approach to ethics, which reduces harm, is necessary unless long-term benefits can be demonstrated with a certain degree of confidence (Zemanova, 2020).

Finally, there is the ethical issue of the short-term versus long-term consequences, which can be used to explain how hard it is to balance temporal scales of moral concern. An effective ethical theory of wildlife management has to wrestle with the imbalance between actual, present pain and hypothetical future values, and must overcome the temptation to view the former as collateral damage in achieving conservation objectives.

2.3 Clarifying Ethical Stakeholders: Individuals, Populations, Ecosystems

The core of discussions in the ethics of wildlife is the issue of moral standing: who/what is an ethical stakeholder? One of the long debates that philosophers and conservationists have contemplated upon concerns whether people should be more interested in animals as individuals, in species, or in whole ecosystems (Varner, 2012). All the positions have specific connotations as to how tagging, tracking, and euthanasia ought to be assessed.

The individualist view asserts that the interest in morality starts and stops at the well-being of sentient beings. Within this scheme, all animals become stakeholders, having their intrinsic value, and their suffering or demise cannot be ethically justified through the mere appeal to benefits on the level of population (Regan, 2017; Francione, 2008). Considering individualist perspective, euthanising an invasive species is not only wrong due to its resulting death, but also wrong in the sense that it does not take into account the moral value of an individual human being in the name of ecological objectives. Such a perspective requires a type of wildlife management that favours non-lethal methods wherever feasible, including fertility control over culling (Ramp & Bekoff, 2015).

In comparison, a population-level approach considers the main stakeholder to be a species or genetic group. This strategy is based on the acknowledgement that conservation activities focus on avoiding extinctions and securing the sustainability of populations and not protecting all life (Rolston, 1988). It is in this perspective, that one regrets to learn about individual losses, which can be accepted as long as it helps to maintain a species. The reason as to why tagging and tracking is justified is because provided the knowledge acquired enhances conservation measures of the entire population. This perspective is also criticised as instrumentalising humans and possibly obscuring ethical deficiencies through the subordination of their well-being to population-level abstractions.

Ecosystem holism creates a further step in that ecological wholes (an ecosystem, biotic community, or even the biosphere) is considered the final moral stakeholder. Aldo Leopold is known to have expressed this view with his land ethic that stated that an act is right when it maintains integrity, stability, and beauty of the biotic community, and wrong when it does not (Leopold, 1989). In this

holistic perspective, destruction of invasive species or killing of diseased individuals can be morally right in as far as it will maintain ecological balance. But, critics caution, the ecological fascism of the ecosystem is that the rights of each animal are sacrificed habitually to the right of the group (Callicott, 1989).

It is important to explain the position of these stakeholders to see the extent of the moral dilemma involved in the management of wildlife. Ethically, practicing things like tagging and euthanasia can be acceptable in certain practices and inexcusable in others. In this way, the competing claims in any full ethical analysis cannot be ignored, nor can one presuppose a single stakeholder model. A potential way forward is to abandon the unitaristic approach in favour of a pluralistic approach that acknowledges competing moral responsibilities to individuals, populations, and ecosystems, and carefully strikes a balance between conflicting moral responsibilities (Palmer, 2020). This pluralism is against reductionism and embraces to the complexity of the moral reality of human-wildlife relationships.

2.4 Ethical Theories Applied to Wildlife Management

2.4.1 Utilitarianism and Wildlife Management

The justificatory paradigm of utilitarianism has frequently been used in the context of wildlife research and management due to its apparent simplicity: moral actions are acceptable provided that they maximise the overall well-being and minimise suffering. In the case of wildlife, the utilitarian reasoning would imply that the damages caused by capture, tagging or euthanasia might be reasonable provided that it brings more benefits to animal populations, ecosystems or even humanity in the long term. Supposing the short-term pain of a collared wolf could be offset by learning about migration patterns, which can then be applied to effective conservation of the species in general (Singer, 2013). On the same note, killing of invasive species, although it is damaging to the individual species, can be justified on the basis that it averts much more unhappiness by saving the ecological integrity upon which the indigenous species rely (Paquet and Darimont, 2010).

However, there are a number of challenges on utilitarianism here. One, the estimation of harms and benefits is frequently very speculative. Tagging programs or euthanasia programs are based on ecological, social and political processes that can hardly be predicted. Removal of invasive species, such as, is not always a guarantee to reestablish ecosystem balance in the face of climate change or habitat destruction that is destabilizing biodiversity (Tomasula et. al., 2023). When this happens, the utilitarian justification fails, because the short-term damage cannot be proven to produce credible long-term benefits. Second, utilitarianism runs the risk of instrumentalising individual animals; it sees animals as disposable in favour of aggregate welfare. This issue is especially urgent in such practices as tagging or tracking, as a result of which people may suffer a long time in order to bring about an unpredictable advantage to the masses (Francione, 2008).

The other issue is that of the extent of utilitarian concern. Classic utilitarianism focuses on sentient

pleasures and pains, but when used to wildlife management tends to be extended to collective benefit in the form of biodiversity or ecosystem resilience (Callicott, 1989). This brings a question, are these social results commensurable to the suffering of the individual or is utilitarianism illegitimately stretching its morality calculus beyond the intelligible comparison? According to the critics, biodiversity and the health of the ecosystem are objective and therefore cannot be measured on the same moral scale as that of individual pain and death (Varner, 2012).

However, the idea of utilitarianism is very useful in that it compels researchers and managers to explicitly account the cost of harm and to pursue those practices that reduce suffering and increase conservation outcomes. The so-called 3Rs concept, Zemanova (2020) believes, can be viewed as a utilitarian-governed effort to streamline practices such that the harms to welfare become limited to the minimum required to meet the conservation targets. Although utilitarianism might not offer a full ethical system in itself, its focus on the trade-off between harm and good cannot be eliminated in directing humane conservation.

2.4.2 Rights-Based Ethics and the Inviolability of the Individual

Strongly contrasted to the utilitarian philosophy, the rights-based ethics claim that individual animals have moral claims that cannot be superseded by references to collective welfare. This model, based on the writings of Tom Regan and Gary Francione, recognizes animals as subjects-of-a-life, who have value and rights that should not be violated by deliberately causing suffering to them (Regan, 2017; Francione, 2008). In this light, the concept of capture, tagging or euthanasia is ethically incorrect as it violates the rights of individual animals by exposing them to harm or death due to reasons that they did not approve. In contrast to utilitarianism, rights-based theories do not accommodate trade-offs whereby one person suffering or death is explained by the benefits of other persons.

Rights-based ethics must be oriented differently in case wildlife management is concerned. Tagging and tracking can offer useful ecological information, yet they remain a form of intrusion into the body and autonomy of an animal, which violates his/her rights. Likewise, even when used to avoid the additional suffering or to maintain the ecosystem, euthanasia creates a moral issue of the death of a person without his or her consent. According to rights-based theorists, these acts are anthropocentric reasoning in which conservation aims set by humans are privileged over the value inherent to animal lives (Donaldson and Kymlicka, 2011).

The major advantage of this method is that it demands moral consistency. Should the non-consensual sufferings of domesticated animals in the laboratories or in the farms be condemned by the society, then the wild animals should also be provided with the same moral right. However, there are also practical and philosophical issues that arise on the basis of this framework. The example is that the endangered existence of the native species is being put under threat by invasive species, the rigid observing of the rights based ethics would not tolerate the lethal treatment that will result in the overall

destruction of the ecological environment. This narrowness, according to critics, makes rights-based ethics unsuited to the realities of conservation, which is messy (Palmer, 2020). Besides, attributing rights assumes a sense of moral agency or subjectivity that is not easy to attribute to non-human animals especially when considering the complex relationships they have in the environment (Varner, 2012).

Irrespective of these criticisms, rights-based ethics is a strong counter to utilitarian justifications. It urges researchers and managers to accept that animals are not only instruments of human ambitions, but creatures of moral status. In a practical sense, this view has motivated the emerging trend of compassionate conservation that denounces the use of lethal control or invasive tagging on the premise that they are not in accord with the acknowledgement of the rights of individuals (Bekoff, 2019). Although rights-based ethics may be impractical to establish across the board, there is an emphasis on achieving respect of individual welfare as an ethical limitation to the decisions made in wildlife management.

2.4.3 Virtue Ethics and the Moral Character of Wildlife Practices

One more unique approach to ethical issues of wildlife management is provided by virtue ethics. Instead of concentrating on outcomes (as utilitarianism does) or rules and rights (as deontology does), virtue ethics poses the question of the kind of character and moral dispositions a human being should develop in his or her relationship with animals and nature. Virtue ethics is founded on Aristotelian traditions, with the stress put on such virtues as compassion, humility, respect, and practical wisdom (Hursthouse, 2011). Applied to wildlife practises, this method would replace the question, What produces the best outcome? or What respects rights, by What would a virtuous person, who has the right attitudes toward animals, do in this situation?

This system would consider such practises as tagging, tracking or euthanasia not only based on their outcomes or observance of rights but also based on whether the practise expresses virtues or vices. As an example, a scientist who expresses sincere compassion and respect to a tagged animal may go out of his way to reduce stress and refine procedures or find other non-invasive approaches. On the other hand, a system of mass culling which is purely utilitarian in nature can demonstrate a want of humility or deference to the individual lives, despite any ecological payoffs. Virtue ethics therefore identifies the ethical dangers of desensitisation, in which conservationists who get used to killing animals may forget about virtues that can help to promote humane coexistence (Palmer and Sandoe, 2021).

Virtues ethics is also focused on context-sensitivity and practical wisdom (phronesis). No straightforward rules and calculations exist that can provide definite answers in many conservation dilemmas (Towolawi, 2026). Rather, a morally admirable agent should critically consider the specifics of the context-species, ecological interests, options- and endeavour to behave in a manner that seems indicative of a compassionate and respectful character. This flexibility of situations allows

virtue ethics to be quite well placed to the complex and uncertain situations of wildlife management, where principles may not suffice.

Critics express it though that virtue ethics lacks the same prescriptive clarity as utilitarianism or rights based theories. Conversion of virtues into real policies or rules that can be adopted by ethical review boards might not be easy. Nevertheless, it has gained power due to its humanising influence: in creating the virtues, a researcher and a manager are less inclined to talk about animals as data sets and obstacles and more prone to contemplate them as living creatures that also need to be treated morally (Bekoff, 2019). The morale of this orientation has similarity with the morale of compassionate conservation, which promotes conservation activities that do not only conserve ecosystems, but are benevolent, empathetic, and ethical in their interactions with other animals.

3. RESULTS AND ANALYSIS

3.1 Case Analysis: Tracking

Such technologies as radio telemetry and GPS collars have become irreplaceable in the contemporary wildlife study and management. The gadgets enable conservationists to keep track of movement trends, examine habitat utilization, and capture the dangers of poaching or habitat division (Kays et al., 2015). Nevertheless, there is an ethical complication with their application: the information being collected with the help of tracking can be the key to the survival of whole species or habitats, but the process of capturing, sedating, and implanting animals with such tools causes stress, pain, and sometimes permanent behavioural changes (Wilson and McMahon, 2006). This leaves the moral issue whether the misery of single animals could be compensated with the future conservation gains that tracking will offer.

Utilitarianism would justify tracking should the harms it causes be less than its benefits of long-term gains of increased conservation. Indicatively, the use of GPS collars on the elephants has been found to decrease poaching as the rangers can predict the migration routes and take action more efficiently (Douglas-Hamilton et al., 2005). When this happens, temporary agony of a few people is compensated by saving many lives. The utilitarian calculus is no simple thing, however. Tracking systems can cause injuries, entanglements or even death because ill-designed collars have even become too tight or have served to inhibit natural behaviours (Murray and Fuller, 2000). In case the level of harms of the practise is more general and grave than expected, then the concept of the practise fails in its own consequentialistic principle.

The deontological ethics brings deeper concerns, as to whether people can ever become the means to an end. When they take a wild animal, put it under sedation and collar it, it does not agree to the intrusion into its body. In rights-based perspective, this kind of intervention is dangerous because it instrumentalises the animal to serve human interests, whether it is going to be of benefit or not (Regan,

2017). Although the results of the conservation may be positive, infringement of the autonomy of the individual is ethically problematic. This criticism brings to focus the fact that the moral status of animals may require respect which cannot be superseded by common good, no matter how urgent it may be.

The virtue ethics, in its turn, causes one to question the morality of the researchers and conservationists. Do the normalising restraint, sedation, and invasive tracking practises cultivate such virtues as compassion and humility, or are there threats that it may become habitual and thus grow into a habit of moral insensitivity to animal suffering? Hursthouse (2006) notes that a virtuous agent must be effective as well as cautious in terms of moral worth of his relationship with non human beings. A conservationist, who wears a collar without reflecting on the ethical implications of such a practise, may appear to be doing it, but fail in virtue, so long as the lived reality of the animal on whom such intervention is administered is not taken into consideration.

A deep contradiction in wildlife ethics is thus seen in its case of tracking. On the one hand, tracking technologies allow invaluable data on the preservation of species in an age of intensive destruction of the ecological environment. They subject animals on the other hand to pain, stress and even death. Any philosophically plausible course of action must find a compromise between these conflicting assertions with the realisation that conservation demands would not exonerate human beings of the immediate harms they bring. It means that the practise needs further refinement: the devices should become less invasive, less bulky, an uninvase monitoring technology should be developed, such as a drone or a camera trap, and the interventions should be backed by demonstrably and clearly-specified conservation goals (Cooke et al., 2004). It is only at this point that tracking can be more closely associated with a vision of wildlife ethics that considers the well being of individuals as well as the integrity of ecosystems.

3.2 Case Analysis: Euthanasia

The most critical ethical challenge in the nexus of conservation and animal welfare is possibly euthanasia in the wildlife management. In contrast to tagging or sedation, which are temporary diagnoses with more or less risk, euthanasia means killing of an animal. It is used in a variety of situations: to alleviate the misery of animals that are injured but not dead, to regulate invasive species that can threaten the native biodiversity, or to regulate excess species whose growth is disruptive to the ecosystem. Although the etymology of euthanasia, or good death, implies mercy and compassion, the practise in wildlife scenarios is hardly ever that straightforward, as it involves the conflict between the good of people and the perceived good of the people or the ecosystem as a whole (Tomasula et. al., 2023).

Utilitarianism would support euthanasia in the event that it results in the most total decrease in suffering. An example is the removal of invading grey squirrels in the United Kingdom has been

justified by the need to conserve the native populations of red squirrels which are becoming extinct because of competition and transmission of diseases (Bertolino & Genovesi, 2003). Likewise, the eradication of feral cats is usually claimed to stop extensive predation of the endangered bird species (Nogales et al., 2004). In these situations, loss of life of individuals is calculated against survival of the vast masses and well being of the ecosystems. Furthermore, in a particular situation when a sick or a dying animal is incurable, it might seem that the most humane thing to do is to end its life. The utilitarian calculus instead does not see euthanasia as a crime against welfare, but a form of compassion or warranted sacrifice to greater ecological benefits.

But this utilitarian thinking is full of challenges. It first presupposes that ecological advantages in the long term are definite and they exceed the moral cost of killing. There is a lot of uncertainty however in conservation results: eliminating an invasive species does not necessarily recreate the ecological balance, and culling one species may accidentally break the food webs in unpredicted directions (Vucetich and Nelson, 2007). Second, the utilitarian calculations have a chance of making individual animals fungible items in a welfare equation disregarding their value and individual life histories. This reductionist approach has the drawback of suggesting that animals are a means to an end of conservation, and that the right of animals to live is ensured at the cost of the common good of usefulness (Regan, 2017).

According to deontology, euthanasia is much more challenging to justify. Deliberate killing, even in the name of conservation, is a moral wrong, in case animals bear moral rights, which include the right to life. Regan (2017) and other rights-based theorists believe that every sentient animal has a life of its own, and is intrinsically valuable and thus cannot be superseded by an appeal to aggregate welfare. Destroying invasive parakeets to allow native birds to thrive, or destroying deer to stop overgrazing, might be perceived to be of a morally unacceptable nature notwithstanding the ecological clarifications. Also the so-called compassionate culling which is justified by the concept of merciful action poses a risk of concealing the more substantial wrong of life extermination without consent. In this respect, euthanasia can never be justified ethically without being the sole option of averting long and unnecessary suffering in a particular person.

The virtue ethics makes the situation even more difficult as it does not emphasise the rules or consequences but the morality of the characters executing euthanasia. The main question arises: what kind of moral agent does euthanasia develop? On the one hand, the desire to take away the life of an animal in order not to cause it suffering might represent the virtues of compassion, courage, and practical wisdom. It may be that the wildlife manager who willingly and stubbornly puts the suffering animal to rest is exercising moral uprightness in battling the cruel aspects of nature (Hursthouse, 2006). Alternatively, the routinisation of the management of the population by euthanasia can breed callousness whereby agents become habituated to killing as a quick fix. The danger is that

conservationists will slowly lose their focus on the uniqueness of animals as well as regarding them as abstractions in ecological theory instead of living beings with their own inherent value. Therefore, virtuous ethics requires that the ethics of euthanasia not only be based on the external consequences, but also on the moral traits it produces in human agents.

Another philosophical concern is the morality of the stakeholders. Considering ecosystems or populations as moral beings, it can be argued that a person should be able to be euthanized to preserve the integrity of the entirety (Leopold, 1989). However, when the main antagonistic concern of morality is individuals, as it is in theories of welfare or rights, then euthanasia would be questionable, but only in strictly specified situations of curing incurable pain. The extreme positions are tried to be compromised by hybrid positions. To take one such instance, the model of compassionate conservation stipulates that conservation should not in any way lose the intrinsic value of individuals despite the need to attain greater ecological outcomes (Bekoff, 2019; Ramp & Bekoff, 2015). In this perspective, lethal management techniques should be the last course of action and they should be adopted only after the non-lethal options have shown to be impossible e.g. sterilisation, relocation or habitat modification.

Euthanasia practised as applied to wildlife thus brings out the weakness of moral reasoning in the face of competing goods. It points out the ineffectiveness of purely consequentialist thinking, the inflexibility of rights-based theories and the uncertainties of virtue ethics in the context of conservation problems in the real world. Maybe the most justifiable stance is that of the ethic pluralism where there is an understanding of the tragicness of some of the options, where the ethical seriousness of terminating life is acknowledged, but where it is also acknowledged that in certain situations euthanasia can be the least harmful choice. This position requires a strict examination of the necessity and openness of decision making and constant willingness to find non-lethal alternatives. Most importantly, it involves humility where humans realise that in the course of these actions that are meant to save lives, they are the ones that are causing death.

4. DISCUSSION

4.1 Individual and Collective Welfare—Balancing

4.1.1 The Issue of Moral Standing: Are Ecosystems More Important than People?

The key point on conservation ethics is a disputable query on about the moral status whatever interests, rights or well-being ought to be considered when carrying out wildlife research and management. Is it morally correct to give moral precedence to the sentient animal individual, to populations and species or to the ecosystem as a whole? This question is not only speculative but it defines the ethical correctness of such practises as tracking, and euthanasia which involves the intentional sickening of the individuals animals in the welfare of the common good.

According to animal ethicists such as Regan (2017) and Singer (2011), the issue should be that sentient beings objectively have an individual. To Regan, animals are subjects-of-a-life and have intrinsic value, thus, nobody can deny them their rights in the favour of the sum of utility. Utilitarian Singer upholds that the suffering of all sentient beings must be balanced equally in morality. In these light, the interests of ecosystems over those of individuals should be given priority as this can create a continuation of moral holism where the lives of individuals are seen as a cost to be sacrificed. An example, invasive deer culling to preserve vegetation might preserve the integrity of an ecosystem, but it calls on each cull as a unit to be discarded and consumed, as an adjunct to ecological service. This kind of reasoning seems to go against the ethical necessity to be nice to people and treat them with dignity and respect.

In comparison, ecocentric traditions, including that most notoriously theorised by Leopold (1989) in the land ethic, providing moral status to ecological wholes. Leopold defines a thing to be right when it has the tendency to maintain the integrity, stability and beauty of the biotic community. In this case, individual organisms are not centrally important locus of moral value but are morally important because they modify the operation of ecosystems. This point of view can be used to support such practises as euthanasia of invasive species or using tracking devices that impose burdens on a select few people to maintain larger ecological networks. The moral community is therefore not only extended to sentient beings but also to non sentient beings like rivers, forests and species.

The conflict between these opinions makes manifest a moral ontology conflict. Individualist explanations are based on the moral position of consciousness, rights or subjective welfare and the holist explanations are defined by systemic attributes like resilience and biodiversity (Callicott, 1999). The opponents of holism warn of its possibility of justifying the atrocities of people in case they are considered as expendable to the ecology. On the other hand, individualism opponents note that, it is shortsighted since it does not acknowledge the fact that the well-being of individuals is frequently conditioned by the well-being of nature. In fact, once ecosystems fail, so does the wellbeing of many people.

This dilemma might not be resolved by favouring one over the other but appreciating the interdependence of the personal and the common good. According to Norton (1994), ethical deliberation should leave the abstract priority rules, and consider concrete relationships between individuals and systems depending on the context as suggested by Norton (1994) in his environmental pragmatism. This may in practise entail making sure that the individual harms are minimised even in situations where the collective goals need to be intervened with the proportionality and necessity embedded in the ethical decision-making. So in one way, ecosystems cannot outweigh individuals but neither can individuals be seen in isolation of the aggregate ecological matrix that supports them.

4.1.2 Tensions Between Anthropocentric vs. Ecocentric Perspectives

An associated discord of wildlife ethics is the one between anthropocentric and ecocentric viewpoints. Conservation practises are often defended using the anthropocentric concept of viewing human needs and values as the centre of moral concern in order to gain benefits in the people, be it in the provision of ecosystem services, cultural heritage, or scientific knowledge. As an example, the defence of tracking elephants can be based on the protection of the species, but also due to the fact that the elephants are the main tourist source in ecotourism economies. Equally, invasive species euthanasia is justified through humanistic perspectives in most instances, such as sustaining agricultural output or beautiful scenery (Sandbrook et al., 2019).

Anthropocentrism philosophically is denounced as undergoing the value of nonhuman life to the instrumental worth. According to Plumwood (2002), this structure reproduces human exceptionalism and is likely to justify ecological domination. The intrinsic moral worth of animals is distorted when animals are used as resources to human advantage; be it in research, conservation, or managing them. This prejudice is in practice reflected in conservation policies that focus on charismatic megafauna such as pandas and elephants, and ignore other less visible but ecologically important species. The anthropocentric approach therefore distorts ethical prioritisation obstructing fairness and impartiality in conservation.

Ecocentric views do not integrate this paradigm because moral value is placed on the ecological whole instead of human interest. Ecocentrism relies on the ideas of deep ecology (Naess, 2017) and the land ethic of Leopold to state that people are part of the biotic community and not the masters. The conservation practises are thus supposed to be grounded on their role in achieving ecological integrity rather than just on the welfare of human beings. Only when such interventions as euthanasia or tagging can benefit the prosperity of ecosystems as self-sustaining moral agents would such applications be justified.

But ecocentrism also has philosophical problems. Opponents suggest that this will jeopardise the moral claims of single animals, who will become elements of systemic health (Taylor, 2011). Furthermore, ecocentric methods can occasionally come into conflict with human rights particularly where preservation policies are marginalizing indigenous people or limiting subsistence (Buscher and Fletcher, 2020). Being morally privileged, the ecological whole can also be a new tyranny, which suppresses human and nonhuman beings.

The opposition between anthropocentric and ecocentric views can therefore be seen to be the deeper disputes over where moral value lies, in the well-being of humans, in sentient beings, or in nature itself? Biocentrism, where all living things, not just humans or ecological wholes, are intrinsically valued, may be a way out. Biocentrism recognises the individuality of animals, as well as interdependence of life in the ecosystem (Taylor, 2011). It opposes polarisation of anthropocentrism

and ecocentrism and attempts to find a compromise that takes into consideration the wellbeing of humans and the wholeness of the ecosystems without reducing the one to the other.

4.1.3 Ethical Trade-Offs in Practice: Policy, Law, and Conservation Ethics Boards

As much as philosophical arguments over moral standing and value orientations cannot be ignored, the challenge to wildlife ethics is on the ground- on how policies, laws, and ethics boards strike the trade-offs between individual welfare and collective goods. This is not a typical trade-off in the wildlife research and management. These institutionalised systems of ethical scrutiny, legal control, or policy advice, all bear on whether or not to condone a tagging study, whether or not to legalise the euthanasia of invasive species, or whether or not to subsidise some conservation programmes.

Ethics review committees also referred to as institutional animal care and use committees (IACUCs) are the focal point of research intervention on wildlife permissibility. Their mandate usually contains an equilibrium of scientific value of a study with the welfare costs that animals incur (Cox et al., 2013). But these agencies too can be troubled by the problems of the wildlife setting in which animals cannot be killed or kept in controlled conditions and the long-term consequences of interventions can be difficult to measure. The idea of 3Rs in other words: Replacement, Reduction and Refinement has been applied to minimise harm to the fullest, but its application in the sphere is spoiled with misunderstandings. As an example, is a GPS collar ever a refinement, or can researchers cease invasive techniques of tracking and instead, employ non-invasive techniques such as drones or remote sensors? The lack of consensus makes the immovable ethical dilemma play.

Competing commitments are also represented in legal frameworks. CITES international conventions save endangered species but in a manner which puts emphasis on the species survival at the population level rather than focusing on the individual. Culling programs as a way of maintaining ecosystem services can be sanctioned in national wildlife legislation, and animal welfare law can at the same time ban cruel treatment of individuals. These contradictions reveal the philosophical dilemma between individualist and collectivist ethics still unresolved even in law (Favre, 2010). Practically, different legal systems are more likely to be found swinging between these extremes, depending on the political and cultural circumstances hence supporting instead of ending the ethical ambivalence.

The challenge of balancing the ethical issues is also demonstrated in policy decisions. An example was the justification of the elimination of invasive goats on the Galapagos Islands on the basis that it was needed to safeguard endemic species of animal and plant life, but this entailed the mass murder of intelligent beings (Marsh & Trenham, 2001). Conservation ethics boards had to decide what to do to the unique species which would be lost forever, or the suffering of thousands of goats now. These examples indicate that trade-offs are not a hypothetical option, but a tragic decision that must be clearly ethically justified.

These institutional practises, philosophically, emphasise the shortcomings of abstract principle as well as pure pragmatism. Whereas rights-based theories may be against culling altogether, and ecocentric systems may be in favour of it unconditionally, real-life decisions tend to demand subtle judgments that neither absolutism nor reductionism can offer. Conservation ethics should be dynamic, pluralistic and context-responsive as argued by Minter and Collins (2005) who believe that moral trade-offs cannot be done away with but they have to be negotiated openly.

Therefore, the problem of individual and collective good in policy and practise does not lie in achieving an ultimate solution but in developing institutions that can engage in ethical deliberation over a long period. The issue of the harms and benefits should not be restricted to ethics boards, legal frameworks, and conservation policies, which should explicitly specify the moral assumptions on which their decisions are based. Then only can the management of wildlife be done with integrity, realising the tragedy of its compromises as well as the dignity of the lives involved.

4.2 Toward Humane and Ethically Consistent Conservation

The increasing ethical issues that arise due to such practises like wildlife tracking and euthanasia need not be justified ad-hoc; they need to be combined into a logical system of ethical decisions, which would incorporate the welfare concerns at the individual, collective, and ecological levels. The difficulty in the core of the challenge is balancing competing moral statements between the suffering of individual animals and the survival of a population or an ecosystem and making sure that conservation practises remain scientifically and morally legitimate. In its absence, the risk of inconsistency in the decision-making process is real, as is the utilitarian expediency of decision-making in certain settings, the deontological rigidity in others, and the institutional inertia in the majority of them. Philosophy offers a helpful perspective in which these tensions can be questioned with the beginnings of systematisation of weighing harm, benefits, rights, and duties.

The identification of pluralistic moral standing is one of the main elements of such a structure. Conservation ethics that have traditionally supported environmental conservation put the ecosystems and species survival as the highest priorities (Leopold, 1949; Callicott, 1999). Nonetheless, animal rights philosophers like Regan (2017) and Singer (2011) opposed this idea by stating the fact that no welfare of individual sentient beings should be degraded to the level of tools of environmental justice. This contradiction implies that no one ethical theory is adequate, but decision-making must be a hybrid, which incorporates utilitarian consideration of consequences, deontological considerations of the inherent rights, as well as virtue-ethical consideration of the moral character of conservation practitioners (Hursthouse, 2006). This framework then has to be integrative and the tension between competing claims is irreducible and the decision makers need to be moved towards compromises that are based on reason and not exclusively used to find solutions.

At the applied tier, this framework might be based on the already established ethical review

frameworks, like Institutional Animal Care and Use Committees (IACUCs) or conservation ethics boards, although extended to encompass overt philosophical discussion regarding the ecological effects over time and the dignity of individual animals (Cox et al., 2013). As opposed to viewing welfare assessment as a necessary byproduct to scientific objectives, the framework would have all the suggested interventions subject to a systematised ethical audit, where questions like the following are posed: Does this practise minimise harm in so far as is consistent with the principle of refinement? Is it a dignity and integrity of individual beings? Does the expected conservation good measure up to the damage done? Formalisation of these criteria will help to make ethical decision-making more transparent, accountable, and cross-situated.

The other important aspect is the time aspect of ethical thinking. Conservation also frequently rationalises short-term ecological loss, as a long-term ecological benefit- like killing invasive species to preserve endemic biodiversity or putting monitoring equipment on animals in order to collect important migration information (Vucetich and Nelson, 2007). Such justifications need to be critically assessed using a strong framework that is able to distinguish the cases where the benefits of the future are certain and proportionate enough, as well as those where the appeal to future welfare is a way of anthropocentric or managerial convenience. In this case, it is necessary to use a precautionary ethic: the long-term advantages of mischief are unpredictable or speculative, and the restraint must be a priority to protect the well-being of people in the present (Tomasula et. al., 2023). On the other hand, harm can be ethically justified with careful regulation where the ecological benefit is strongly supported and there is no other alternative that can harm the environment less.

Social and political contexts of conservation should be also sensitive to the framework. The issue of ethical decision-making is not a vacuum phenomenon because this process is shaped by the principles of law, the community, and cultural values (Sandbrook et al., 2019). Indicatively, one society, which may value the sanctity of individual life, may regard euthanasia as morally unacceptable whereas another society may consider it as an important tool of environmental control. An international system should also be flexible in context and support universal interpretations of minimisation of harm and respect of dignity and proportionality. Legitimacy and moral responsibility may be enforced, by instilling conservation ethics into participatory dialogue with the communities affected.

Lastly, this framework would not only regulate the practise, but it would also influence the moral imagination of the conservationists. Virtue ethics is based on the idea that morally right decision making is no longer about weighing harms and benefits but developing compassion, humility and practical wisdom (phronesis) when dealing with moral complexity (Palmer, 2010). The framework would promote the development of these virtues as conservationists would feel that they should not consider themselves as impersonal administrators of life but as moral members of a common ecological society. In such a manner, the framework attempts to overcome the gap between theory and

practise to offer structural principles of ethical review, as well as a moral ethos that defines the anthropogenic relations between humans and animals during the Anthropocene.

5. CONCLUSION

The main conflict of this question has been the moral analysis of the short term loss and long term benefit in the setup of the wildlife conservation methods especially tracking and euthanasia. Although these practises are frequently passed off and explained as the essential instruments of ecological research and species management, they reveal significant ethical quandaries that provoke reconsideration of our attitude to our role in relation to non-human life. What comes out in the above discussion is the fact that conservation is not just a scientific project but also a moral project that needs careful considerations on the values we cherish and the type of relationships we develop with the natural world.

The moral dilemma between long-term and short-term good cannot be addressed using the oversimplistic appeals to either the utilitarian computations or strict rights-based prohibitions. Utilitarianism is correct in emphasising the importance of outcomes, which is a combination of the pain of a few people and the future prosperity of many or even the life of complete ecosystem (Singer, 2011). However, this kind of thinking runs the danger of making the individual life of a person just a unit in a more general calculus of welfare, and overlooks the dignity and inviolability of sentient life which deontological ethics attributes (Regan, 2017). Virtue ethics on the other hand, is a reminder of the fact that the moral nature of our choices is not only dependent on the consequences or rules, but also on the type of moral agents that we will have become by the way we practise (Hursthouse, 2006). These contradictions imply that conservation ethics should be pluralistic to avoid the temptation of reducing itself into one framework, but rather maintain a balance between the legitimate interests of various points of view.

The fundamental question in this balancing act is the question of moral standing. Are the interests of individual animals subordinate to the welfare of ecosystems or species, or should moral claims made by individuals take precedence, in any case, over the welfare of the common good? Ecocentric theories, starting with land ethic (1989) by Leopold and deep ecology (2017) by Naess, hold that the integrity, stability and beauty of ecosystems are intrinsic values, and worth the tough trade-offs. Animal-centred ethics on the contrary, argue that suffering is never irrelevant morally, irrespective of ecology circumstances (Palmer, 2010). The nature of conservation practise lands us in the scenario where these two positions clash either in euthanasia of an invasive species to protect the biodiversity or, the stressing aspect of tracking to monitor the ecological conditions. An ethical conclusion should therefore take note of the fact that there will never be a tragic ending in conservation because anything done will involve some kind of loss. The moral problem is not to avoid such dilemmas but to navigate

them in the manner of wisdom, compassion and integrity.

This implies that the conservation ethics has to take up a system of proportionality and precaution. Proportionality means that any harm caused must be relative to proven benefits to greater areas of welfare, whether of populations or ecosystems, which have to be substantial and evidence-based. The first rule of precaution is that when one has no clear evidence, the default should be skewed towards minimising harm to people instead of making an assumption that future goods will rationalise present suffering (Luper, 2009). These values render the practise of conservation more ethically justifiable so that the descent into wanton utilitarianism or the crippling absolutism can be avoided.

Another conclusion that comes out is that there is a need to institutionalise ethical deliberation during the governance of conservation. Both the moral values and the morality of individual researchers and the ad hoc decisions of field managers cannot be left to the individual conscience of the researchers, or to the ad hoc rationality of the field managers. As mentioned above, conservation ethics boards or larger review boards can provide systematic ways via which one could evaluate the ethical considerations of the proposed interventions (Cox et al., 2013). Such organisations must embrace transparency, accountability to the people and participation of them in the community and they must realise that conservation decisions do not always involve only the non-human lives but also the human communities the livelihood and cultural values of which are interlaced with the wildlife. In so doing, the ethical reflection will not be a hindrance to science but a highly significant part of the validity and social trustworthiness of science.

Perhaps the greatest discovery is the fact that conservation ethics is interested in the growth of moral ethos that is not calculable. To realise the value of non-human entities as such, to see ecosystems as communities, not as resources, to which we belong, to be modest in the face of uncertainty, none of these are merely abstract prescriptions, but moral orientations, which guide the conservation practise of the Anthropocene (Ramp & Bekoff, 2015). The compassion virtue in particular does offer something that can serve as a counter to the devaluation of individual suffering whilst accept the tragicity of hard trade-offs. Once conservation becomes the place where human virtues and vices are attained, we are making ethical decisions at what we are doing, and we are also making ethical identity which is the becoming of moral agents.

REFERENCES

- Bekoff, M. (Ed.). (2019). *Ignoring nature no more: The case for compassionate conservation*. University of Chicago Press.
- Bertolino, S., & Genovesi, P. (2003). Spread and attempted eradication of the grey squirrel (*Sciurus carolinensis*) in Italy, and consequences for the red squirrel (*Sciurus vulgaris*) in Eurasia. *Biological conservation*, 109(3), 351-358.

- Buscher, B., & Fletcher, R. (2020). *The conservation revolution: radical ideas for saving nature beyond the Anthropocene*. Verso Books.
- Callicott, J. B. (1989). *In defense of the land ethic: Essays in environmental philosophy*. Suny Press.
- Callicott, J. B. (1999). *Beyond the land ethic: more essays in environmental philosophy*. State University of New York Press.
- Cooke, S. J., Hinch, S. G., Wikelski, M., Andrews, R. D., Kuchel, L. J., Wolcott, T. G., & Butler, P. J. (2004). Biotelemetry: a mechanistic approach to ecology. *Trends in ecology & evolution*, 19(6), 334-343.
- Cox, L. A., Comuzzie, A. G., Havill, L. M., Karere, G. M., Spradling, K. D., Mahaney, M. C., ... & VandeBerg, J. L. (2013). Baboons as a model to study genetics and epigenetics of human disease. *ILAR journal*, 54(2), 106-121.
- Donaldson, S., & Kymlicka, W. (2011). *Zoopolis: A political theory of animal rights*. Oxford University Press, USA.
- Douglas-Hamilton, I., Krink, T., & Vollrath, F. (2005). Movements and corridors of African elephants in relation to protected areas. *Naturwissenschaften*, 92(4), 158-163.
- Favre, D. (2010). *Animal law: Welfare, interests, and rights*. Wolters Kluwer.
- Francione, G. L. (2008). *Animals as persons: Essays on the abolition of animal exploitation*. Columbia University Press.
- Fraser, D. (2008). Understanding animal welfare. *Acta Veterinaria Scandinavica*, 50(Suppl 1), S1.
- Hursthouse, R. (2006). Applying virtue ethics to our treatment of the other animals. The practice of virtue: *Classic and contemporary readings in virtue ethics*, 136-155.
- Hursthouse, R. (2011). Virtue Ethics and the Treatment of Animals. In T. Beauchamp & R. Frey (eds.), *The Oxford Handbook of Animal Ethics*. Oxford University Press.
- Kays, R., Crofoot, M. C., Jetz, W., & Wikelski, M. (2015). Terrestrial animal tracking as an eye on life and planet. *Science*, 348(6240), aaa2478.
- Leopold, A. (1989). *A Sand County almanac, and sketches here and there*. Oxford University Press, USA.
- Luper, S. (2009). *The philosophy of death*. Cambridge University Press.
- Marsh, D. M., & Trenham, P. C. (2001). Metapopulation dynamics and amphibian conservation. *Conservation biology*, 15(1), 40-49.
- Minteer, B. A., & Collins, J. P. (2005). Why we need an “ecological ethics”. *Frontiers in Ecology and the Environment*, 3(6), 332-337.
- Murray, D. L., & Fuller, M. R. (2000). A critical review of the effects of marking on the biology of vertebrates. *Research techniques in animal ecology: controversies and consequences*, 15-64.

- Naess, A. (2017). The shallow and the deep, long-range ecology movement. A summary. In *The ethics of the environment* (pp. 115-120). Routledge.
- Nogales, M., Martín, A., Tershy, B. R., Donlan, C. J., Veitch, D., Puerta, N., ... & Alonso, J. (2004). A review of feral cat eradication on islands. *Conservation biology*, 18(2), 310-319.
- Norton, B. G. (1994). *Toward unity among environmentalists*. Oxford University Press.
- Palmer, A. (2020). *Ethical debates in orangutan conservation*. Routledge.
- Palmer, C. (2010). *Animal ethics in context*. Columbia University Press.
- Palmer, C., & Sandoe, P. (2021). Welfare, Ethics and Wild Animals. *Animals*, 11(9), 2609.
- Paquet, P. C., & Darimont, C. T. (2010). Wildlife conservation and animal welfare: two sides of the same coin?. *Animal Welfare*, 19(2), 177-190.
- Plumwood, V. (2002). *Feminism and the Mastery of Nature*. Routledge.
- Ramp, D., & Bekoff, M. (2015). Compassion as a practical and evolved ethic for conservation. *BioScience*, 65(3), 323-327.
- Regan, T. (2017). The case for animal rights. In *Animal rights* (pp. 17-30). Routledge.
- Rolston, H. (1988). *Environmental Ethics: Duties to and Values in the Natural World*. Temple University Press.
- Sandbrook, C., Fisher, J. A., Holmes, G., Luque-Lora, R., & Keane, A. (2019). The global conservation movement is diverse but not divided. *Nature Sustainability*, 2(4), 316-323.
- Singer, P. (2011). *Practical ethics*. Cambridge university press.
- Singer, P. (Ed.). (2013). *In defense of animals: The second wave*. John Wiley & Sons
- Taylor, P. W. (2011). *Respect for nature: A theory of environmental ethics*. Princeton University Press.
- Tomasula, J., Maguire, B., Rippel, T. M., Lopez, E., Perez, S., Arab, A., ... & Wimp, G. M. (2023). Conditions for collapse: Chronic nutrient enrichment increases native insect density linked to salt marsh dieback. *Biological Conservation*, 278, 109882.
- Towolawi, S. A. (2026) Ethics in Clinical Research in Pharmaceutical Regulatory Affairs-I. Publisher: ShivKesh Publication.
- Varner, G. E. (2012). *Personhood, ethics, and animal cognition: Situating animals in Hare's two level utilitarianism*. Oxford University Press.
- Vucetich, J. A., & Nelson, M. P. (2007). What are 60 warblers worth? Killing in the name of conservation. *Oikos*, 116(8), 1267-1278.
- Wilson, R. P., & McMahon, C. R. (2006). Measuring devices on wild animals: what constitutes acceptable practice?. *Frontiers in Ecology and the Environment*, 4(3), 147-154.
- Zemanova, M. A. (2020). Towards more compassionate wildlife research through the 3Rs principles: Moving from invasive to non-invasive methods. *Wildlife Biology*, 2020(1), 1-17.