

Role of Veterinarians in Biodiversity Conservation

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Introduction

Habitat loss, climate change, pollution and emerging diseases are driving species toward extinction at alarming rates (Ceballos et al., 2017). In this landscape, veterinarians play an unexpectedly pivotal role beyond the clinic. A One Health perspective recognizes that animal health, human health, and ecosystem health are deeply interconnected[1]. Veterinarians' expertise in animal physiology and disease makes them natural stewards of wildlife and environmental health. They monitor and manage diseases in wild and domestic populations, care for injured wildlife, and even help design habitat conservation strategies. In effect, veterinarians are linchpins in preserving biodiversity, bridging the gap between veterinary medicine and conservation biology.

Veterinarians work at the interface of animal and ecosystem health. One Health frameworks emphasize that “the health of humans is closely connected to the health of animals and our shared environment,” and that professionals – including veterinarians – must collaborate to protect people, animals and habitats (CDC, 2025). In practice, this means vets contribute to conservation on many fronts. They advise on wildlife management and ecosystem restoration, study diseases that threaten entire species, and help control outbreaks that could decimate vulnerable populations. For example, veterinarians helped design vaccination and monitoring programs to slow the spread of rabies among African wild dogs and distemper in seals, protecting these threatened species from catastrophic disease outbreaks (Reading et al., 2013).

Disease Surveillance and Health Monitoring

Veterinarians lead wildlife health surveillance programs. By sampling wild animals and their environments, they detect new diseases early and prevent them from spreading. In one illustrative case, a veterinary-led monitoring project sampled migratory waterfowl for avian influenza, detecting dangerous viral strains before poultry farms were affected. Similarly, bat biologists in North America, often working alongside wildlife veterinarians, have used routine health checks to track the spread of white-nose syndrome (a deadly fungal disease) across cave-hibernating bat populations. These surveillance efforts give conservationists a head start in responding to threats. As Pathade et al. (2024) note, veterinarians design and analyze surveillance programs that assess wildlife population health,

enabling early intervention against pathogens and pollutants. By catching outbreaks early, vets not only safeguard wildlife but also protect livestock and human communities from zoonoses.



Veterinarians also regularly assess population health. In endangered species programs, vets perform routine health checks to monitor body condition, reproductive status, and stress levels. For example, mountain gorilla monitoring teams include veterinarians who collect fecal samples and observe signs of respiratory illness. When pneumonia outbreaks were detected early, targeted treatments and habitat interventions helped prevent population collapse (Pathade et al., 2024). By tracking birth and mortality rates alongside health metrics, vets provide conservation managers with data on whether a population is growing or declining. This population health monitoring—analyzing trends in age, disease prevalence and reproduction—alerts teams to emerging threats like parasites or nutritional deficits.

Wildlife Rescue, Rehabilitation and Field Medicine

When wildlife are sick, injured or orphaned, veterinarians step in to save individuals and bolster species' chances. Wild animals are victims of car accidents, habitat destruction, and disasters like fires or oil spills. Wildlife veterinarians and rehabilitators rescue these animals, provide emergency treatment, and release them back into the wild when possible. Pathade et al. (2024) highlight that veterinarians “rescue, treat, and rehabilitate injured or orphaned wildlife,” actions that contribute not only to individual animal welfare but to the conservation of their species. The 2019–2020 Australian bushfires underscored this role: hundreds of wildlife vets and volunteers treated burned kangaroos, koalas, and birds, preventing local extinctions by saving thousands of animals. In zoos and

sanctuaries around the world, vets also care for endangered species (e.g. black rhinos, parrots, pangolins), enabling breeding programs and reintroductions that replenish wild populations. By maintaining the health of at-risk animals, veterinarians directly support biodiversity preservation.

Conservation Medicine and Research

Veterinarians contribute scientific expertise to conservation research and “conservation medicine.” They study how diseases, genetics, and reproduction affect populations, informing strategies to sustain them. For example, vets have researched Tasmanian devil facial tumor disease (DFTD) – a contagious cancer that wiped out much of the devil population in Tasmania. Wildlife vets helped develop captive breeding programs and experimental vaccines that slow DFTD spread. Veterinarians also measure wildlife genetic diversity, study nutritional ecology, and evaluate the impact of pollutants on animal health. These research efforts translate into practical conservation actions.

Paramita (2023) emphasizes that veterinarians “understand the intricate relationships between species and their environments” and so play “a vital role in preserving the integrity of ecosystems”. Indeed, vets often collaborate with ecologists to restore ecosystems: they assist in reintroduction programs (e.g. returning captive-bred wolves or condors to their native habitats) and help manage human-wildlife conflicts by advising on fence designs or deterrents. By applying medical knowledge to ecological problems, veterinary scientists strengthen conservation strategies and adaptive management plans.

Wildlife Forensics and Anti-Trafficking

Veterinarians have forensic skills to combat illegal wildlife trade. Using DNA, isotope analysis, and pathological exams, they identify species from confiscated animal parts and determine how those animals died. For instance, veterinary forensic teams can trace seized ivory or rhino horn back to specific populations, helping law enforcement target poaching hotspots. They also examine baby or injured animals to determine if they were illegally captured. This scientific evidence is critical for prosecuting wildlife crimes and dismantling trafficking networks, thereby protecting endangered animals and their ecosystems.

Habitat Conservation and Ecosystem Health

Beyond individual animals, veterinarians engage in habitat and ecosystem conservation. They help monitor environmental health and restore ecosystems that support wildlife. As Paramita (2023) note, vets conduct habitat surveys and identify threats like pollution, invasive species, or fragmentation that undermine ecosystem resilience. For example, a wildlife vet might analyze soil and water quality in

a wetland to diagnose why a frog population is declining, then recommend habitat cleanup or restoration. Veterinarians often join interdisciplinary teams planting native vegetation, building fish ladders, or creating wildlife corridors to connect isolated habitats. Such corridors allow animals to migrate safely, maintaining genetic diversity. In Africa and Asia, vets have helped design wildlife bridges over roads or assisted in resettling animals to greener pastures after fires or development. Through these actions, veterinarians contribute to keeping ecosystems intact – a cornerstone of biodiversity. In summary, as the Colombian researcher Intan Paramita observed, veterinarians use their expertise in wildlife health to “create and maintain habitats that support thriving wildlife populations”.

Advocacy, Policy and Public Engagement

Veterinarians also influence conservation through policy and education. Professional organizations recognize this role: for instance, the World Veterinary Association’s One Health policies explicitly include environmental and biodiversity protection, urging vets to advocate for ecosystem health. On the ground, many veterinarians work with NGOs, governmental wildlife agencies and local communities. They train park rangers to collect biological samples, advise on humane wildlife management laws, and help formulate national wildlife disease plans. Public outreach is another key arena: by speaking at schools or using social media, veterinarians raise awareness about conservation issues. For example, wildlife vets often educate pet owners and farmers about preventing disease spillover to wild species. As one veterinary conservationist put it, veterinarians occupy a special position to convey conservation messages. The concept of the human-animal bond can be extended beyond pets: veterinarians can link people’s affection for animals to stewardship of nature. By explaining how human health depends on healthy ecosystems (the One Health message), vets build public support for preserving biodiversity^[1]. In short, vets serve as ambassadors of biodiversity, translating scientific knowledge into community action and policy.

Conclusion

Biodiversity conservation is a complex, multidisciplinary challenge, and veterinarians are indispensable players in the effort to protect it. Their medical expertise equips them to diagnose and stop diseases that threaten species, while their knowledge of animal behavior and ecology helps in habitat restoration and species management. Veterinarians also serve as “first responders” in wildlife crises – from oil spills to poaching emergencies – and as scientific advisors in research and education. As Macon One Health unifies people, animals and ecosystems into a single vision, making veterinarians key to that collective

mission[1]. In every corner of the globe, vets are working quietly to safeguard wild worlds: vaccinating wolves, checking gorillas' vital signs, restoring fish habitat, and ensuring farms operate sustainably. With ecosystems under mounting pressure from climate change and human activity, the veterinary community's role will only grow more critical. By integrating veterinary science into conservation teams, we boost our chances of preserving Earth's natural heritage. In this way, veterinarians help ensure that the rich tapestry of life on our planet endures for future generations.

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