

## **IUCN WCPA Technical Note Series No. 5 IMPROVING PROTECTED AND CONSERVED AREA MANAGEMENT TO SAFEGUARD ECOLOGICAL INTEGRITY AND MINIMISE ZONOTIC DISEASE RISK**

**This Technical Note provides advice to managers of protected and conserved areas<sup>1</sup> (PCAs) for applying a ‘One Health’ approach for the benefit of environmental, animal, and human health.**

The spread of zoonotic diseases is often associated with land-use changes and habitat loss. When PCAs are equitably governed and effectively managed, they can protect habitats and wildlife populations and minimize the risks of disease transmission between humans and wildlife, i.e. ‘zoonotic disease spillover’. Therefore, investing in the expansion and management of PCAs is essential not just for biodiversity conservation but also for protecting human health. It is also worth noting that PCAs are important for fostering climate change resilience, supporting human livelihoods and wellbeing, maintaining cultural identity and resources, and providing clean water and air among other ecosystem services.

This Technical Note emphasizes ‘zoonotic disease’ risk management as an important issue for PCA managers. The COVID-19 pandemic, caused by the SARS-CoV-2 virus, demonstrates that society has not invested sufficiently in zoonotic disease prevention and response preparedness. As PCAs are widely-used approaches to safeguarding species and ecological integrity, they also play a critical role in public health and well-being.

### **KEY MESSAGE**

**As PCAs are key tools for protecting species and ecological integrity, they also have a critical role to play in safeguarding public health.**

### **ONE HEALTH: PRINCIPLES AND THEIR APPLICATION TO PCAs**

A One Health approach is a framework for collaboration and integration among many disciplines working locally, nationally and globally, so as to achieve optimal health outcomes for people, domestic and wild animals, and the environment. In the context of PCAs, the One Health approach does not replace the need for PCA managers to undertake their regular management duties, but encourages highly collaborative and

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<sup>1</sup>*Protected area* follows the IUCN definition (Dudley, 2008). *Conserved area* is used here as an informal term to describe “areas sustaining ecological integrity and/or effective in situ conservation of nature” (Jonas & Jonas, 2019). Conserved areas include but are not limited to ‘other effective area-based conservation measures’ (IUCN-WCPA, 2019).

innovative means for implementing practices that already benefit biodiversity conservation and local people livelihoods.

The following actions and practices may be adopted for zoonotic disease risk reduction by incorporating them into PCA management, as appropriate for each particular context and according to the availability of resources and capacity in place.

### ***1. Recognize and disseminate the value of PCAs to minimise zoonotic disease risks***

As zoonotic disease is a risk factor in many PCAs, responses need to be part of strategic planning by:

- Adopting a mission statement for PCAs that explicitly recognizes their role in safeguarding of ecological, wildlife and human health as vital interrelated goals;
- Promoting the value of natural habitats and wildlife while communicating that direct contact between humans and wildlife must be minimised to prevent spillover.

### ***2. Protect and restore the ecosystem health of PCAs***

Through design and management strategies, ensure that PCAs are effectively safeguarding ecological systems and human health, by:

- Ensuring through multiple landscape-level strategies the maintenance of a full complement of native species and ecological structures and functions;
- Taking measures to restore ecological resilience, including strategic restoration interventions in areas that have suffered land-use change or invasive alien species impacts;
- Protecting and restoring ecological connectivity throughout terrestrial and aquatic systems, enabling species movement and healthy ecological system flows (e.g., nutrients, wastes).

### ***3. Manage human-wildlife contacts***

Through policy, planning, zoning and education measures, reduce the risk of contact among wildlife, domestic animals and humans thereby preventing pathogen transmission or spillover) by:

- Managing, excluding and removing domestic animal (agricultural, pet and feral) species that transmit pathogens between wildlife and people;
- Enacting prohibitions on the possession of certain types of domestic animals (e.g., non-human primates as pets or for tourist exhibition);
- Establishing controls on the feed and grain provided to domestic animals, to avoid potential transmission of diseases from rodents;
- Implementing rodent trapping and euthanasia programmes when necessary in communities inside or close to PCAs.

### ***4. Prevent wildlife from being drawn toward people***

Reduce the risk of wildlife transmitting zoonotic pathogens to PCA staff, tourists and people living within and at the margins of PCAs by reducing direct contact. Wildlife bites, crop-raiding and the occupation of human dwellings by zoonotic pathogen hosts present obvious spillover risks, as well as health-threatening issues arising from indirect contact with wildlife saliva and excrement. PCA managers can help prevent the risks of wildlife human interaction by:

- Prohibiting feeding wildlife;
- Requiring visitors to remain in vehicles;
- Securing human food waste and excrement;
- Fencing wildlife out of agricultural, business and dwelling areas.

While fencing PCAs to isolate wildlife from human activity is a potential approach to reducing human-wildlife conflict, PCA managers should be aware of the various implications of fencing for zoonotic disease management. Some fences function as environmental stressors, reducing landscape immunity, and potentially facilitating land use-induced spillover. In other situations, fences may be an effective approach to mitigating zoonotic exposure risk from large mammals, but other measures (e.g. chemical and biological control) will be needed to prevent ‘vector’ bites. In some situations, ecological fencing (e.g. planting hedgerows of native vegetation) may meet ecological, wildlife and human health goals.

### **5. Promote capacity development and establish partnerships**

It is suggested that:

- PCA staff undertake One Health training through capacity development programmes, such those presented by the World Health Organization (WHO) and the United Nations Food and Agriculture Organization (FAO);
- Establish partnerships with experts in human and veterinary medicine to conduct zoonotic pathogen and disease surveillance, as well as research, within and surrounding PCAs.

### **KEY DEFINITIONS**

*Hosts:* for zoonosis, animals (usually vertebrates) that harbour and support zoonotic pathogens.

*Invasive alien species:* non-native organisms that harm or pose an unacceptable risk of harm to ecological, economic, health or other societal assets; also known as invasive species.

*Landscape immunity:* the ecological conditions that, in combination, keep pathogen populations in check and foster the immunological defences of wild species within a particular ecosystem.

*Land use-induced spillover:* the process by which land use change fosters the ecological conditions that facilitate zoonotic pathogen infection of wildlife, wildlife shedding pathogens in a manner that humans are exposed, spillover of pathogens into the human population, and further spread of pathogens among people as a series of inter-related events (‘the infect-shed-spill-spread cascade’). Land use change is considered broadly as all anthropogenically-induced ecosystem change.

*One Health:* the collaborative efforts of multiple disciplines working locally, nationally and globally to attain optimal health for people, animals and environment.

*Spillover:* the transmission of zoonotic pathogens from vertebrate animals (wildlife or domestic) to humans.

*Vectors:* organisms (esp. insects) that transmit zoonotic pathogens between hosts (e.g., mosquitoes).

*Zoonotic diseases (zoonosis):* diseases caused by zoonotic pathogens.

*Zoonotic pathogen:* disease-causing organisms transmitted from vertebrate wildlife, sometimes through domestic animal intermediaries, to humans.

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