

## Appendix II

# Key Messages for Wetland Managers and Policy Makers

### 1. Introduction to diseases in wetlands

#### KEY MESSAGES FOR WETLAND MANAGERS AND POLICY MAKERS

- The term '**disease**' is used to define any impairment to health resulting in dysfunction. There are **many disease types**, including: infectious, toxic, nutritional, traumatic, immunological, developmental, congenital/genetic and cancers.
- **Disease is often viewed as a matter of survival or death when, in fact, effects are often far more subtle**, instead affecting productivity, development, behaviour, ability to compete for resources or evade predation, or susceptibility to other diseases factors which can consequentially influence population status.
- **Well functioning wetlands** with well managed livestock, with little interface, with well managed wildlife should provide human wetland dwellers with the **ideal healthy environment in which to thrive**.
- **Disease is an integral part of ecosystems** serving an important role in population dynamics. **However, there are anthropogenic threats affecting wetlands** including climate change, substantial habitat modification, pollution, invasive alien species, pathogen pollution, wildlife and domestic animal trade, agricultural intensification and expansion, increasing industrial and human population pressures including the interface between humans and domestic and wild animals within wetlands, all of which may act as drivers for emergence or re-emergence of diseases.
- **Wetlands are meeting places** for people, livestock and wildlife and **infectious diseases can be readily transmitted** at these interfaces.
- **Stress is often an integral aspect of disease** capable of exacerbating existing disease conditions and increasing susceptibility to infection. **There are a broad range of stressors** including toxins, nutritional stress, disturbance from humans and/or predators, competition, concurrent disease, weather and other environmental perturbations. Stressors can be additive, working together to alter the disease dynamics within an individual host or a population.
- **Impacts** of disease on public and livestock health, biodiversity, livelihoods and economies **can be significant**.
- **The emergence and re-emergence of diseases has become a wildlife conservation issue** both in terms of the impact of the diseases themselves and of the actions taken to control them. Some diseases may be significant sources of morbidity and mortality of wetland species and in some cases (*e.g.* amphibian chytridiomycosis) can play a role in multiple extinctions of wetland species.

## 2. Principles of managing diseases in wetlands

### KEY MESSAGES FOR WETLAND MANAGERS AND POLICY MAKERS

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### 3. Practices of managing diseases in wetlands

#### 3.1 Assessing risk and planning for the future

##### KEY MESSAGES FOR WETLAND MANAGERS AND POLICY MAKERS

- To ensure consideration for **disease prevention and control** is **at the heart of wetland management**, activities need to be **integrated into wetland management plans**. Clearly defined roles and responsibilities are required to ensure effective management which can deliver a range of benefits to stakeholders.
- **Risk assessments are valuable tools for animal health planning** and serve to identify problems/hazards and their likely impact thus **guiding wetland management practices**. From these assessments, risk management and communication actions can be taken. **Good** local, national and regional **surveillance data** are needed **for robust risk assessments**. Risk assessments are living documents which require regular revision.
- **Multidisciplinary advisory groups provide a broad range of benefits** for disease prevention and control. Their role is to review epidemiological and other disease control information, inputting to the activation of agreed contingency plans and advising the appropriate decision makers on future contingency planning. As appropriate, wetland managers can play a key role in these groups.
- **Contingency plans aim to consider possible emergency disease management scenarios** and to integrate **rapid cost effective response actions** that allow the disease to be prevented and/or controlled. It is advisable to develop bespoke contingency plans for specific high-risk/high-priority diseases and also generic standard operating procedures (SOPs) that may be common to many situations. Plans and SOPs should be documented and tested with a broad range of stakeholders in 'peacetime' (*i.e.* outwith any emergency situation), and subjected to periodic review.

#### 3.2 Reducing risk of disease emergence

##### KEY MESSAGES FOR WETLAND MANAGERS AND POLICY MAKERS

- An **understanding by the wetland manager of the uses** of a wetland and its catchment by people, industry, agriculture including livestock, and wildlife, coupled with an appreciation of risk factors for disease emergence, can **provide a sound foundation for disease risk reduction**.
- It is **important that wetland managers identify stressor risks** within their site and the broader catchment/landscape, and understand that these may change over time. Once these factors are identified, **they can be managed and/or their impact mitigated**, as appropriate.
- **Disease zoning** (although challenging in wildlife and/or aquatic systems) **can help control some infectious diseases** through the delineation of infected and uninfected zones defined by sub-populations with different disease status. Buffer zones separating infected and uninfected zones may consist of physical barriers, an absence of hosts, an absence of disease vectors or only immune hosts *e.g.* following ring vaccination. **Appropriate levels of surveillance are required** to accurately define zones and for prevention of disease spread to

occur, the movements of animals between zones, needs to be restricted.

- **The movement of infected animals to new areas and populations represents the most obvious potential route for introduction of new/novel infections.** The risk of transmission and spread of disease can be **minimised by conducting risk assessments and following certain standardised national and international guidelines and regulations** for moving, relocating and/or releasing animals. A disease risk analysis should be conducted for any translocations for conservation purposes.
- **Biosecurity** in wetlands refers to the **precautions taken to minimise the risk of introducing infection (or invasive alien species)** to a previously uninfected site and, therefore, preventing further spread. Infectious animal diseases are spread not only through movement of infected hosts but also their products *e.g.* faeces, saliva *etc.* or *via* human and fomite (inanimate object) contact with animals and their products. **Constructed treatment wetlands can assist greatly in reducing risks** from contaminated wastewaters.
- Where possible, **biosecurity measures should be implemented routinely** as standard practice whether or not an outbreak has been detected. A regional/supra-national approach to biosecurity is important for trans-boundary diseases, particularly those where domestic and international trade are considered as important pathways for disease spread, *e.g.* trans-boundary aquatic animal diseases.
- **If wetland stakeholders understand the principles and value of biosecurity** and what measures to take, this will **encourage the development of an everyday ‘culture’ of biosecurity** which can help disease prevention and control.
- **Implementing biosecurity measures in the natural environment can be extremely challenging**, particularly in aquatic systems, and although eliminating risk will be impossible, **a substantial reduction in risk may be achievable**, particularly where several complementary measures are employed.

### 3.3 Detecting, assessing and responding to new disease

#### KEY MESSAGES FOR WETLAND MANAGERS AND POLICY MAKERS

- The **detection** of new, emerging disease, robust **risk assessments**, and effective **disease control** in and around wetlands, **all rely on effective disease surveillance and monitoring.** Surveillance programmes should be well designed with clearly defined aims and objectives. Robust surveillance requires appropriate methods for sample collection, recording, storage and transportation, which in turn depend on well trained personnel and adequate resourcing.
- **Timely and accurate diagnoses and early warning systems for disease emergence are critical for swift responses**, achieving effective disease control and minimising losses and costs. Early warning systems may depend on a comprehensive understanding of a wetland site and catchment, good disease intelligence from a range of stakeholders (including crucially the wetland manager, as well as data from local and national disease surveillance programmes), and clear systems and networks for communication and reporting.
- **Identifying** when a disease presents a ‘**problem**’ is complex and **requires** thorough disease investigation and existing **good long term surveillance** information.
- In the event of a suspected outbreak of disease, **wetland managers are not expected to be**

**the final disease diagnostician.** However, they should **play a key role in an outbreak investigation** team being ideally placed to provide the crucial contextual epidemiological information about timing of events, the populations at risk, the effects on these, land use and environmental conditions at the time and leading up to the outbreak, and other relevant local information.

### 3.4 Managing disease

#### KEY MESSAGES FOR WETLAND MANAGERS AND POLICY MAKERS

- **The appropriate approach to disease management will depend on the characteristics of the problem** and, when dealing with an infectious disease, on the correct identification of reservoirs, hosts and vectors of infection. **Management measures may target the pathogen, host, vector, environmental factors or human activities.** Ultimately, an **integrated approach** involving several complimentary measures is likely to be most **successful** in managing diseases in wetlands.
- **Disinfection and sanitation** procedures target pathogens and can be **very effective at controlling spread of infection** but must be **used with caution in wetland situations** to avoid negative impacts on biodiversity.
- **Animal carcasses** represent a significant **potential source of infection** and **require rapid and appropriate collection and disposal.** Disposal options are varied and again need to be used with caution in wetland situations to reduce risks of pollution of water courses or further spread of infection.
- **Targeting vectors in integrated disease control strategies can be effective** and usually take the form of environmental management, biological controls and/or chemical controls, or actions to reduce the contact between susceptible hosts and vectors. To reduce negative impacts on biodiversity **caution must be used when using these measures within wetlands.**
- **Vaccination programmes,** often supplemented by other disease control measures, **can help control** and even eliminate diseases affecting livestock. Vaccination of wildlife is feasible but it is often complex - other management strategies may be of greater value.
- **Habitat modification in wetlands can eliminate or reduce the risk** of disease, by reducing the prevalence of disease-causing agents, vectors and/or hosts and their contact with one another, through the manipulation of wetland hydrology, vegetation and topography and alterations in host distribution and density.
- **Movement restrictions of animals and people,** usually imposed by government authorities, can be an **effective tool** in preventing and controlling disease transmission through avoiding contact between infected and susceptible animals.
- **Complete eradication of a disease requires a thorough understanding of its epidemiology, sufficient political and stakeholder support** and thorough resourcing and is thus rarely achieved! Elimination of disease from an area is a more likely outcome although this depends on measures to prevent re-emergence being taken. 'Stamping out' (involving designation of infected zones, quarantine, slaughter of susceptible species, safe disposal of carcasses and cleaning and disinfection) is a management practice used for rapidly reducing the prevalence of a disease during an outbreak situation.

### 3.5 Communication, education, participation and awareness (CEPA)

#### KEY MESSAGES FOR WETLAND MANAGERS AND POLICY MAKERS

- Well planned, targeted and resourced CEPA programmes for wetland stakeholders are essential for raising awareness and appreciation of wetland diseases and the measures that can be taken to successfully prevent, detect, control and mitigate disease outbreaks. Such programmes should be integrated into all wetland disease management strategies.
- Programmes should aim to inform wetland stakeholders of the basic principles of healthy habitat management, thus reducing the risk of a disease outbreak.
- A 'culture' of proactive disease management can only be developed if a broad range of wetland stakeholders participate in CEPA programmes.
- Communication strategies should aim to make stakeholders aware of the nature and potential consequence of animal disease and of the benefits gained from prevention and control measures. They should ultimately encourage people to take the recommended courses of action in preventing and controlling a disease outbreak. Awareness raising campaigns should emphasise the importance of early warning systems and of notifying and seeking help from the nearest government animal and/or human health official as soon as an unusual disease outbreak is suspected.
- Selection of the appropriate message, the messenger and the method of delivery is critical for successful communication.
- A strategy, written in 'peacetime' for dealing with the media can increase likelihood of successful outcomes from this relationship maximising potential benefits and minimising potential negative impacts.
- Simulation exercises and testing of contingency plans are a valuable method for training.