





# Water-related diseases

The draining of swamps is a well known example of human modification of wetlands to improve health, and it contributed to the eradication of malaria in many parts of Europe. However, the deliberate removal of wetlands because of the diseases they may harbour is an unsustainable approach to wetland management that can backfire through ecological mechanisms that are only just beginning to be understood.

In many parts of the world, human health is directly affected by wetland-associated diseases. Malaria (because mosquitoes breed in wetlands) and diarrheal infections, including cholera (because of sewage contamination), are globally the

**HPAI.** Control of this disease should be undertaken through improved poultry management practices and response strategies to outbreaks, with killing wild birds or destroying wetlands strongly discouraged. Effective biosecurity, that reduces contact between poultry and wild birds, is central to the long-term control of this economically important disease.

two worst in terms of their human impact, accounting for 1.3 and 1.8 million deaths respectively in 2002 and causing disability

and suffering in many millions more. A serious disease burden also results from other diseases, however, such as schistosomiasis, Japanese encephalitis, filariases, onchocerciasis and others that affect millions of people. The vast majority of these diseases are seen in children under five years old, particularly in Africa, Asia, and parts of the Americas.

On the other hand, diseases resulting from the absence or removal of wetlands also need to be considered: controlling malaria was one of the driving forces for wetland destruction in the past, but such destruction has led to the loss of vital ecosystem services such as the provision of clean water and supply of food. One third of the world's population lacks sufficient clean water for drinking, personal hygiene and cooking. This staggering health statistic is a direct result of human populations exceeding the carrying capacity of the wetlands that provide our basic water supplies. Even when water is available in abundance, wetland ecosystem disruptions can carry a heavy disease burden: over-irrigation results in standing water in which disease-carrying mosquitoes can breed, and water used by industry often allows toxins to enter the human food chain. Degraded wetlands with humans and both wild and

domestic animals living in close proximity also increase infection risks from the spread of 'emerging' diseases, such as Highly Pathogenic Avian Influenza (HPAI).

The removal of wetlands is therefore not a disease management option that should generally be considered. The incidence of many of these diseases can instead be reduced through provision of clean water, improved sanitation, and – importantly – good management of wetlands. Sustainable approaches to the management of wetlands include, for example, the use of fish that consume mosquito larvae, or of bacterial larvicides that kill them without affecting other organisms. Better design, management, and regulation of dams and irrigation schemes and water drainage systems are other examples of such practices, and significant disease reduction can be achieved by combining different approaches.

When ecosystem services fail, human health suffers, and every attempt should therefore be made to find management solutions that benefit both ecosystem health and human health concurrently.

