EcoHealth
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ECOHEALTH

In This Issue

The Story of a Protozoan

Finch trichomonosis is a disease caused by a protozoan, which emerged in Great Britain in 2005. It has led to epidemic mortality and a significant population decline of greenfinches (*Carduelis chloris*) and chaffinches (*Fringilla coelebs*) in central and western England and Wales in the autumn of 2006. In this study, **Lawson et al.** show that since then the epidemic has spread towards eastern England during 2007, and internationally to southern Fennoscandia in 2008. In addition, molecular sequence data show no variation between the British and Fennoscandian strains of the protozoan, *Trichomonas gallinae*. The authors discuss how bird migration, as a plausible mechanism for the observed pattern of disease spread, is supported by epidemiological and historical ring return data, and suggest the chaffinch as the most likely primary vector. While migrating birds are often suggested as vectors for viral diseases, this study is believed to be the first documented case where migrating birds are shown to be spreading a protozoal emerging infectious disease.

Heal Our Broken Wings

Wing damage is common among bats that have been affected by white-nose syndrome (WNS), which is caused by a fungus that has its most deadly effects during the winter hibernation period. Interestingly, the prevalence of wing damage has been known to decline as the summer progresses. **Fuller et al.** tested the hypothesis that bats are healing from severe wing damage. The authors found that at least some of the little brown myotis bats undergo rapid healing early in the active season. This goes to show that the bats can exhibit unexpected resilience to serious, yet non-lethal, wounds and thus that WNS surveillance practices should also incorporate knowledge of wing healing. The authors also present several hypotheses that should be tested to fully understand the role of healing in long-term survival of WNS-affected bats.

Scarpering Salamanders

Batrachochytrium dendrobatidis (Bd) infects frog skin, causing lesions and impairment of the skin respiration. However, lungless salamanders (*Plethodontidae*) are especially vulnerable because they rely on skin respiration only. **Van Rooij et al.** have established a sampling protocol to maximize the detection probability of Bd in salamanders. They used a protocol to sample captive and wild Mexican salamanders. Specifically, it is recommended to sample the pelvic region, the hindlimbs, forelimbs, and the ventral side of the tail. The authors found a high prevalence of Bd in the deceased captive animals and a limited presence in the wild animals. These findings are suggestive of the involvement of the chytrid fungus in the recent declines of plethodontid populations.

Wild Berries for Wellness

Northern indigenous communities are often highlighted as at high risk due to environmental and social changes, particularly regarding climate change. Promoting community wellness in the face of these threats depends on a broader focus beyond physical and nutritional health and tapping into the multiple values of local resources. **Flint et al.** engaged three Alaskan Native communities in participatory research to blend scientific exploration of bioactive health properties of wild berries with local traditional ecological knowledge. Involvement by local residents and

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youth in interviews, surveys, and field bioassays has led to rich insights into diverse dimensions of community wellness, including the importance of locally available foods and socio-cultural traditions.

In a State of Solastalgia

In this communication article, **McNamara and Westoby** explore the experiences of older women, also known as ''Aunties,'' regarding climate change on Erub Island in the Torres Strait region of Australia. Documenting and analyzing the experiences of women in relation to climate change will help to better understand the gendered nature of climate change, and therefore enrich existing debates on climate change impacts. For the Aunties interviewed, their experiences of and responses to climate change impacts have been entangled with a sense of solastalgia (i.e., feelings of sadness, worry, declining sense of self and belonging). The authors present these gendered perspectives in the hopes that they will provide insight into the impacts of climate change that are affecting indigenous populations around the world.

Schisto, Some Assessments

Prior to the mid 1980's, Lake Malawi human populations were free from schistosomiasis transmission, except for some protected shores with abundant vegetation or around inflowing rivers. **Madsen et al.** now report that transmission is very intense along some open shorelines with sandy sediment at certain villages in the southern part of the lake. This change is likely to have been brought about by overfishing activity along these shorelines, causing reduction in density of molluscivorous fishes and reducing predation pressure on the intermediate host snail, *Bulinus nyassanus*, that in turn allows the snails to increase in abundance.

Consequently, transmission of *Schistosoma haematobium* along some open sandy shorelines in Lake Malawi was able to become established during the 1980's, most likely due to this overfishing and subsequent ecological release. In another article, **Madsen and Stauffer**, **Jr.** provide data on densities that support this hypothesis and propose implementation of a fish ban to protect fish populations in the shallow water along such shorelines. In order to reduce dependence on natural fish populations, they suggest that inland habitats be converted into aquaculture ponds using only indigenous species. The authors believe that with proper management, fish production can be high and at the same time transmission of schistosomiasis may be reduced.

Mercury on the Brain

In the riverside communities of the Amazon, mercury exposure in people occurs through fish consumption. In this study, **Fillion et al.** present the results from an ecosystemic research project that has been ongoing for the past 11 years in the village of Brasília Legal. By following fish consumption, mercury levels, visual, and motor functions as well as gathering data through questionnaires, the authors show that dietary changes that resulted in decreased mercury exposure can be attributed to the community-based campaigns and socio-economic changes. They found that, while there may be a certain reversibility of motor deficits, visual capacities may decrease progressively depending on exposure before the intervention. This case exemplifies how a follow-up study may demonstrate whether an intervention successfully achieved the desired results and help to further advise policy changes.

Lawncare Reform

Scientific findings indicate substantial health risks for humans from home lawn pesticide use. Meanwhile, mitigation minimally entails reducing pesticide usage. **Hernke and Podein** discuss how a sustainability lens suggests that detailed effects of pesticide technology are not clear, but that patterns of use create causes for harm. A precautionary approach also suggests reducing use of pesticides that are not persistent but are suspected to cause significant harm. Integrated pest management and organic alternatives are available to reduce lawn pesticide use, and more adventurous landscape options can be made socially acceptable by integrating cues to care. It will therefore be crucial to link local stakeholders to state and federal venues to advance U.S. pesticide policy.

Hymenopterous parasitoids like *Trichogramma* are very important species in the ecosystem because of their role in regulating populations of other insects and often are used as biological control against numerous pests. Although not targeted, they may be exposed to insecticides either directly through agricultural sprays or indirectly

through environmental pollution. **Delpuech and Leger** determine the effects of chlorpyrifos, one of the most used insecticides worldwide, on the exploitation of host patches by *Trichogramma*. The results show that, even when chlorpyrifos does not induce the death of the insect, it still reduces the insect's reproductive efficiency by inhibiting its capacity to identify host eggs through antennal examination that have already been infested, as well as by prolonging the time needed to infest host patches. These results highlight a new possible impact of the sublethal effects of insecticides on ecosystem equilibrium.