Protecting outdoor workers from intensifying heat waves

Jennie Dusheck

Each day in July 2017, more than 13 million American workers were exposed to extreme heat. At 100% humidity, a temperature of 35°C can be fatal in ~6 hours, because sweat does not evaporate fast enough to cool the body. Yet industries that employ outdoor workers have only a patchwork of guidelines for preventing heat-related illness, even as heat waves become hotter and longer.

In August, a team of 51 experts detailed 40 ways to protect workers from heat stress. Their list (*GeoHealth* 2021; doi.org/10.1029/2021GH000443) includes training both staff and supervisors to recognize signs of heat illness; monitoring heat indices; monitoring workers themselves; and providing shade, drinking water, and ice, among other actions.

A wealth of evidence links heat stress to reduced productivity, but many employers hesitate to enforce guidelines, as they want their employees to keep working. Similarly, farmworkers, who are typically paid based on how much they harvest, know that their income will drop if they stop or slow down because of the heat.

T Webster/Wikimedia (CC BY-SA 2.0)

Farmworkers in San Luis Obispo County, California.

This spring, the US House and Senate introduced the Asunción Valdivia Heat Illness and Fatality Prevention Act of 2021. If passed, the Act would require the Occupational Health and Safety Administration to create a national heat standard for workers. Margaret Morrissey, president of the National Heat Safety Coalition at the University of Connecticut's Korey Stringer Institute (Storrs, CT) and the study's lead author, says her team's 40 strategies complement and support a national standard. "[Our list] will enhance employer adoption of occupational heat safety practices that are evidence-based", she says. Many employers want workers to wear devices that monitor heat stress, Morrissey says, "but the science is not there yet".

The federal bill would require employers to pay workers during rest breaks. For farmworkers, paid rest could help reduce the incentive to keep working beyond human endurance.

Lee Newman, an MD at the Colorado School of Public Health (Aurora, CO) who is unaffiliated with the *GeoHealth* study, says that heat illness standards should include prevention. It is not enough for supervisors to spot a fainting worker and get them to a rest station, he argues; at some threshold of temperature, humidity, and worker effort, water and electrolytes alone are not enough, and work just needs to stop. Equally important, he contends, is listening to workers. "[Public health experts and employers] can opine all they want…[but] we need to actually ask workers what they need in order to be safe, to receive a fair wage, and to be productive without hurting themselves."

Indigenous-led research shows impacts of industry on wildlife

Niki Wilson

Whitefish Lake First Nation (WLFN) is a Canadian Treaty 8 Nation of 3000 people living in northern Alberta. Although they have subsisted on the region's wildlife for millennia, they've been given little say in the approval or management of resource extraction projects within their traditional territory. Having observed changes to wildlife populations on their land, WLFN recently partnered with scientists at the University of Victoria (UVic) on a camera-trapping study to evaluate how different industrial features might account for these changes (*Facets* 2021; doi.org/10.1139/facets-2020-0087).

Incorporating Traditional Ecological Knowledge (TEK) and Western science methodologies into the study design, the team deployed 100 wildlife camera traps in 2018 and 2019 across traditional WLFN territory, most frequently capturing images of snowshoe hare (*Lepus americanus*), moose (*Alces alces*), white-tailed deer (*Odocoileus virginianus*), Canada lynx (*Lynx canadensis*), black bear (*Ursus americanus*), wolf (*Canis lupus*), and coyote (*Canis latrans*). UVic scientists analyzed the dataset by applying several different models to see which natural and anthropogenic features best explained the distribution and relative abundance of mammal communities.

They found that resource extraction affected the distribution of all seven of the above-mentioned species. Specifically, oil and gas extraction features, such as well sites, apparently lured black bear, wolf, coyote, lynx, and snowshoe hare; WLFN TEK suggests hare and other prey species are likely attracted to vegetation regrowth after well decommissioning or abandonment, and that predators follow. This puts predators and prey in closer contact than they would otherwise be, explains study coauthor Jason Fisher (UVic; Victoria, Canada). "Well sites can spatially restructure where animals live on the landscape. It's alarming, as the boreal forest in Alberta is rife with such sites."

That predators may prosper in part through improved access to prey at well sites could have negative consequences for moose, a culturally important species that many WLFN communities rely on to feed their families, says Fisher. According to WLFN TEK, moose populations have been declining across WLFN territory, and they avoid areas with forestry and energy extraction activities. This was corroborated by the camera-trap study, though moose occurrence was most highly associated with mining features and transportation corridors. Armed with this information, WLFN can now target those sectors for co-management and better project planning, says Fisher.