

Birds are not the only ones impacted by guidance to cease bird feeding

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Abstract

1. Humans have a particularly strong connection with birds, driving the enormous popularity of residential bird feeding in much of the world.
2. We conducted a web search to document US state wildlife management agency responses to two recent avian disease outbreaks, finding that 23 agencies made recommendations to cease feeding wild birds in 2021–2022.
3. The psychological benefits of bird feeding for humans are well-documented but often overlooked in management decisions in response to avian disease outbreaks.
4. Likewise, ecological evidence does not necessarily support ceasing bird feeding to reduce the spread of every avian disease.
5. Ecological and social science need to be applied in tandem to ensure that well-intended guidance to cease feeding of birds does not have unintended consequences.

KEYWORDS

avian disease, bird feeding, fish and wildlife agency, human–wildlife interaction, mental well-being, social–ecological systems, wildlife management

1 | SOME AGENCIES ARE RECOMMENDING THAT PEOPLE STOP FEEDING WILD BIRDS

Bird feeding is the most popular form of intentional residential habitat modification for wildlife attraction, with over 60% of households in North America, Europe, Australia and New Zealand

providing food for wild birds (Jones, 2018). In the United Kingdom (U.K.) and continental Europe, the estimate of bird seed sales is \$660 million U.S.D. annually, with 13 million households participating in the U.K. alone (Jones, 2018). In the United States (U.S.), 57 million people engage in bird feeding, and Americans spend more than \$12 billion U.S.D. annually on wild bird food and wildlife-watching equipment (U.S. Department of the Interior, U.S.

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Fish and Wildlife Service, U.S. Department of Commerce, Bureau USC, 2018).

Despite the popularity of this activity, governmental agencies, particularly in the U.S., increasingly respond to outbreaks of bird disease by providing recommendations to cease bird feeding. For example, at least 23 U.S. state agencies made recommendations for residents to cease feeding wild birds, typically temporarily, due to avian disease outbreaks during 2021–2022 (Table 1; Table S1). Notably, a still-unidentified avian disease in spring 2021 in the U.S. led federal and state agencies along the middle Atlantic coast and beyond to issue official recommendations for residents to take down their bird feeders until further notice, despite the lack of evidence of a connection between the avian disease and feeding birds. Additionally, that year recommendations to cease feeding were issued in response to a Salmonellosis outbreak that resulted in human and bird cases of illness. The U.S. Centers for Disease Control and Prevention suggested that human infections were connected to contact with wild birds, but also noted that infections may be prevented by washing hands after bird feeding and/or avoiding handling dead birds (Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), Division of Foodborne Waterborne and Environmental Diseases (DFWED), 2021). Again, in summer 2022, several state wildlife management agencies issued statements asking people to remove bird feeders from their yards over concern about a global outbreak of a highly pathogenic avian influenza (H5N1) with cases detected in wild birds across the U.S. (Table 1; Table S1). Yet, those statements were then reversed or conflicted with other public agency announcements that this outbreak was primarily a concern with domestic poultry¹ and not wild birds that visit feeders. Some U.S. state wildlife management agencies are moving towards longer-term bans by considering, or already taking, a more permanent stance against people feeding wild birds given possible disease-related outbreaks. For example, the Wildlife Health Lab at the California Department of Fish and Wildlife recommends that the public not feed or provide water for wild birds due to disease impacts (California Department of Fish and Wildlife, 2023).

Recommendations by U.S. state agencies to stop feeding birds appear to be somewhat unusual compared to elsewhere in the world; although a similar recommendation had been made in the Canadian province of Newfoundland and Labrador (Newfoundland & Labrador Department of Fisheries Forestry and Agriculture, 2021). For example, in the U.K., only cleaning of bird feeders has been recommended by the government in response to avian influenza (Department for Environment Food & Rural Affairs, Animal and Plant Health Agency, 2022). Non-governmental organizations, like the British Trust for Ornithology in the U.K., provide

TABLE 1 Type of avian disease and the number of U.S. state wildlife management agencies implementing statewide or local recommendations/advisories to cease bird feeding activities in response to the presence of avian disease in 2021–2022. Full details of recommendations/advisories (including wildlife management agency, general timeframe and communications) are available in Table S1.

Avian disease of concern	Number of state wildlife management agencies implementing recommendations to cease bird feeding in 2021 and 2022
Avian influenza	3
Salmonellosis (or suspected salmonellosis in <i>Spinus pinus</i>)	5
Unidentified avian disease	15

the majority of guidance on bird feeding globally (Baverstock et al., 2019).

Public response to recommendations to cease feeding has not been systematically studied. Yet, anecdotal evidence from social media and websites shows frustration, fear and concern, resulting in mixed intentions to comply with the recommendations. Some comments on websites with state agencies' announcements indicate intended compliance with their recommendations to cease feeding despite an overall negative emotional response such as this: "... Tomorrow I will be cleaning again and putting away [my feeders] for awhile [sic]. I would rather be unhappy about taking my feeders/birdbaths down, than see a dead bird in my yard from my negligence. I'm sure my birds are going to be pretty angry at me" (Connecticut Fish and Wildlife, 2021). Many comments also showed confusion, such as, "No dead ones in my area. Your advice is a little contradicting [sic]..." (Ohio Division of Wildlife, 2021), or incredulity, "I never stopped. Do they think birds only congregate at feeders & bird baths? Seriously?" (Pennsylvania Game Commission, 2021).

Evidence as to the proportion of the public that make changes to bird feeding behaviour, based on recommendations, is also lacking. Bird feeding is a largely private activity—typically at people's own residences. In countries like Australia, despite strict anti-feeding policies, a large proportion of the population continues to feed birds (Jones, 2018). Ensuring compliance with activities in the privacy of someone's home, garden or deck is challenging, due to the lack of visibility of the activities. For example, past research shows that even persuasion campaigns have little impact on residential outdoor water conservation in people's homes (Landon et al., 2016). In order to ensure compliance with a residential deer feeding ban in Minnesota, instituted to control bovine tuberculosis, the agency flew surveillance flights and engaged the public in reporting illegal activities of their peers with success (Carstensen et al., 2011). Yet, restricting supplemental feeding of deer in Michigan was less successful than in Minnesota, likely due to the tradition of feeding being more widespread. Surveys of the U.S. public show that feeding birds is far more common than

¹According to the Center for Disease Control, as of 1 March 2023, over 58 million domestic poultry have been affected by avian influenza, over 6000 cases have been detected in wild birds, and one case has been detected in humans in the United States (Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases (NCIRD), 2023).

feeding other wildlife (Sinkular et al., 2022; U.S. Department of the Interior, U.S. Fish and Wildlife Service, U.S. Department of Commerce, Bureau USC, 2018), suggesting that public compliance with bans on bird feeding is also likely low.

2 | WHAT ARE AGENCIES MISSING? THE HUMAN BENEFITS OF FEEDING BIRDS

While government wildlife agencies are typically mandated to manage wildlife with public interests—current and future—in mind, these recent U.S. agency recommendations to cease bird feeding overlook the potentially extensive psychological benefits for humans from this activity (Cox & Gaston, 2016; Dubois & Fraser, 2013; Galbraith et al., 2014; Goddard et al., 2013). These agency decisions are particularly problematic during times of public stress, such as in a global pandemic like COVID-19, when human mental well-being has been shown to be better when people are in contact with nature close to home (Phillips et al., 2023). Seeing or hearing birds through activities such as feeding can cause lasting improvements to mental well-being (Hammoud et al., 2022). Benefits of human–nature interactions appear especially strong in urban areas (White et al., 2013) and in times of social isolation (Cartwright et al., 2018). Furthermore, opportunities to interact with wildlife around the home are particularly important to older populations (Randler et al., 2020), and more than a third of the Americans who feed birds also have physical and mental disabilities or other mobility challenges (Sinkular et al., 2022). Such outcomes are notably relevant today given reduced opportunities for people to directly experience nature (referred to as ‘extinction of experience’; Cox & Gaston, 2016) due to increasing urbanization; bird feeding has been associated with significant increases in connection to nature in adults (Hammond, 2020).

Further study is needed to understand the complex links between mental well-being and bird feeding, and the ways such links are influenced by characteristics of humans, birds and the environment in which they interact. In lieu of a more nuanced understanding of these complexities and how agencies’ recommendations interact with them, agencies need to consider the potential negative impacts of their recommendations on a public already in a mental health crisis (Pfefferbaum & North, 2020) and increasingly alienated from nature (Gaston & Soga, 2020) as they also weigh ecological evidence for their decisions.

3 | DOES BIOLOGICAL EVIDENCE SUPPORT CESSATION OF FEEDING?

Among certain feeder-using bird species, such as some members of the finch family, bird feeding has contributed to the emergence, transmission and spread of infectious diseases on multiple continents. For example, in North America, eastern populations of House Finches (*Haemorrhous mexicanus*) declined by half following the appearance of the novel bacterial pathogen *Mycoplasma gallisepticum*

(Hochachka & Dhondt, 2000). Similarly, Salmonella outbreaks associated with irruptive influxes of Pine Siskins (*Spinus pinus*) congregating at feeders in winter have caused high mortality in this species, as well as non-lethal Salmonella cases in people that feed birds (Hernandez et al., 2012). Two species of feeder birds in Great Britain, the European Greenfinch (*Chloris chloris*) and Common Chaffinch (*Fringilla coelebs*), declined due to a recently emergent disease that spreads at feeders, finch trichomoniasis, with disease impacts being especially marked in peri-domestic habitats where bird feeding is common (Hanmer et al., 2022).

Bird feeding can also benefit birds in ways that might help mitigate widespread declines in common species. For example, in the Eastern U.S., populations of many urban-adapted species who use feeders have remained largely stable in the last 50 years, in contrast with precipitous declines for other bird species (Rosenberg et al., 2019). Feeding may improve individual bird condition or energy stores (quantified via individual fat storage) relative to non-fed birds (Galbraith et al., 2017; Wilcoxon et al., 2015), which may be particularly important for helping birds survive infections (Fischer & Miller, 2015). Feeding may also allow some species to persist in heavily human-modified habitats. Frequent use of feeders in urban settings is thought to have imposed selection pressure on Great Tit bill morphology to better exploit seed feeders in the U.K. and Netherlands (Bosse et al., 2017), and winter feeding can support declining farmland birds in intensively farmed landscapes (Pierret & Jiguet, 2018). Overall, bird feeders may be one way that bird populations persist in the residential habitats that now dominate many parts of the globe, although concerns exist that this may contribute to biological homogenization at the landscape scale, whereby feeder-adapted common birds (often introduced species) can outcompete declining specialists (Galbraith et al., 2015; Shutt & Lees, 2021). In sum, the net effect of feeding on bird populations is likely to be species or location specific and dependent on numerous ecological factors (natural food availability, predation risk, etc.).

Decisions to ban feeding at large spatial scales, particularly in the absence of strong biological evidence implicating feeders in spread of a given disease, may have unintended and unexpected consequences. Even in cases where feeders are directly implicated in the spread of a given pathogen, recommendations to cease feeding lack robust scientific tests of the effectiveness of such a management strategy. Two field experiments found that the addition of bird feeding stations to a habitat is associated with higher prevalence or abundance of parasites and diseases for some species at those sites (Galbraith et al., 2017; Wilcoxon et al., 2015). While this provides indirect support for the possibility that the removal of feeding stations might, in turn, reduce disease spread for some bird species, the overall impact of ceasing feeding on birds is likely a result of many complex factors, including the presence and quantity of other food sources. To date, there are no direct tests of whether ceasing of intentional bird feeding influences disease prevalence and/or population levels of feeder species. However, studies of bird species that lose access

to unintentional feeding sites (landfills, garbage dumps) find that reduced access to such sources of food is associated with lower apparent survival for young Yellow-headed gulls *Larus michahellis* (Delgado et al., 2021), reduced numbers of breeding pairs of Rooks *Corvus frugilegus* (Olea & Baglione, 2007), and predicted declines in breeding populations of White Storks *Ciconia ciconia* (López-García et al., 2023). Interestingly, Yellow-headed gulls also appear to expand their foraging ranges when access to refuse is reduced (Arizaga et al., 2014). Theory predicts that wildlife using a mix of food-subsidized and unsubsidized sites experience the highest levels of infection, because food-subsidized sites promote local pathogen spread, while unsubsidized sites with less predictable food availability promote inter-site movement, and thus pathogen spread across the landscape (Becker et al., 2018; Teitelbaum et al., 2021). Thus, ceasing residential bird feeding that leads to dispersal or expanded foraging ranges could augment disease levels across the landscape. Direct experimental tests of how the ceasing of bird feeding influences demographic rates, foraging behaviour and disease prevalence of bird species at a variety of spatial scales are needed.

4 | THE PATH FORWARD: SOCIAL-ECOLOGICAL EVIDENCE AS A GUIDE FOR MANAGEMENT ACTION

There is a strong need for wildlife management agencies to address human-wildlife interactions in residential landscapes in line with the best ecological and social science to avoid policy decisions that could have unintended negative consequences for wildlife or people (Figure 1). A number of conceptual frameworks have integrated social and ecological factors to understand human-wildlife interactions (e.g. König et al., 2021; Lischka et al., 2018; Morzillo et al., 2014). Most relevant to feeding, Dubois and Fraser (2013) present a framework for evaluating wildlife feeding in a range of contexts using three factors: the ability to control the activity, its effects on conservation and the long-term welfare of animals involved. Under this framework, backyard bird feeding is one of a few cases of wildlife feeding deemed acceptable in their work. Furthermore, Dubois and Fraser (2013) suggest that banning wildlife feeding may be unrealistic, as described above, and that current approaches to management of feeding lack consistency. A global review of bird

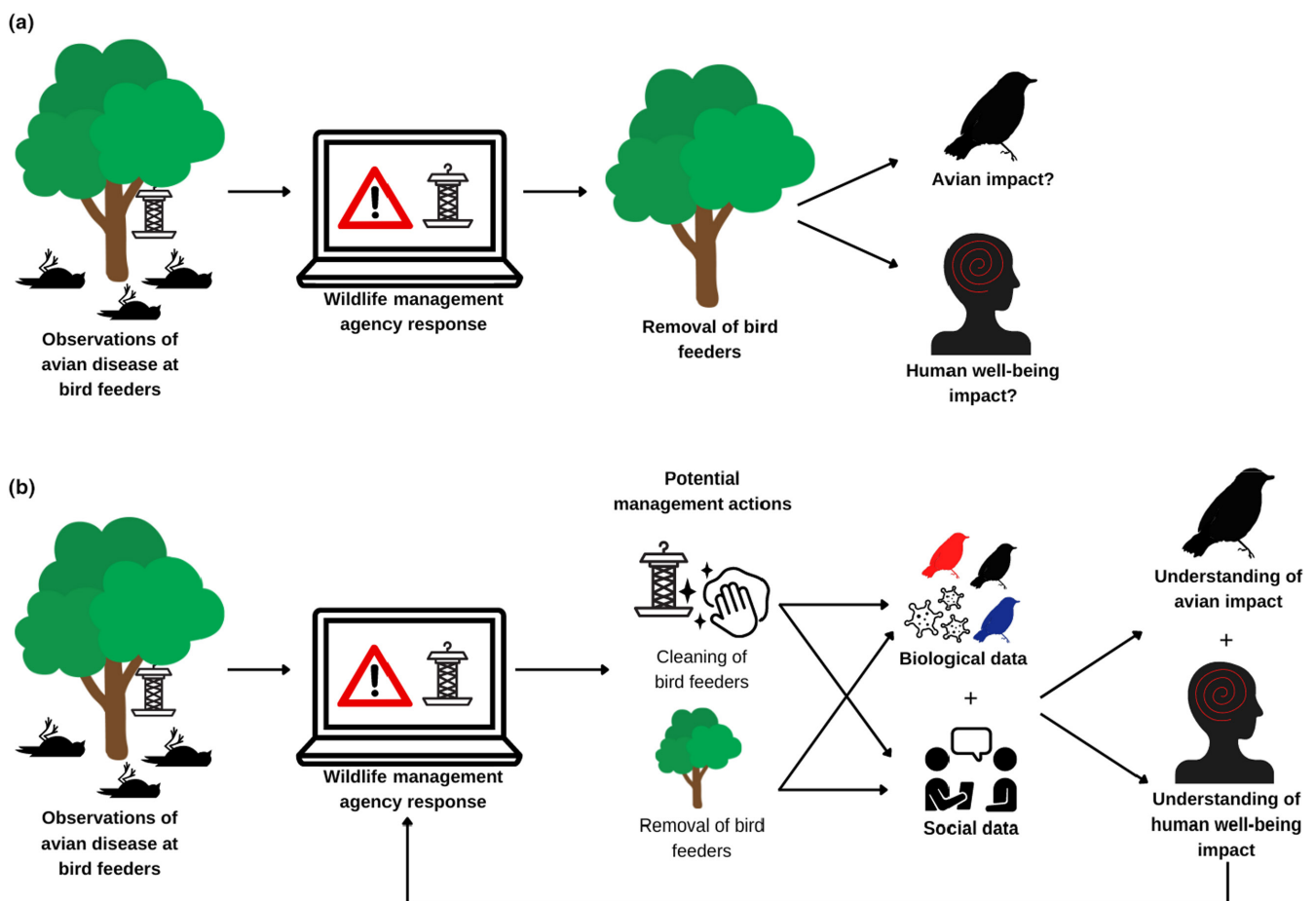


FIGURE 1 (a) The status quo management approach and (b) a suggested adaptive management approach of avian disease and public feeding of wild birds by wildlife management agencies. (b) incorporates biological (e.g. avian disease, abundance and species richness) and social evidence (e.g. human emotional response, mental well-being, habitat management actions) to ensure that agencies are empowered to consider the potential negative impacts (on both humans and birds) of recommending the public to cease feeding of wild birds in residential landscapes.

feeding policies by Baverstock et al. (2019) emphasized the need for clear, consistent and readily available policy advice and to consider potential costs and benefits for both humans and birds. Baverstock et al. (2019) also warn against taking broad-sweeping positions, like banning feeding, due to diverse socio-ecological contexts within countries and a current lack of 'good' science.

As some agencies have shown, recommendations to cease bird feeding are not the only policy option. For example, the Virginia Department of Wildlife Resources in the U.S. promotes best practice guidelines for bird feeding, including regular cleaning and disinfecting of feeders. Similarly, in the U.K., the citizen science program Garden Wildlife Health provides Best Practice Guidelines, stating that it is "important to do all that we can to maximise the benefits and minimise the risks associated with feeding garden birds" (Garden Wildlife Health, 2021). Field studies show that frequent cleaning can reduce parasite levels in feeder birds (Schaper et al., 2021), and levels of bacterial growth on feeder surfaces (Boyd et al., 2014); recent field tests of ivermectin-coated seed (Holcomb et al., 2023) show promise in using creative approaches to reduce disease spread at the population level in birds. Notably though, even cleaning 'best practices' need more scientific validation, and the benefits of recommended cleaning practices may even be context dependent, with one study reporting reduced bird-parasite loads when feeders were cleaned in rural but not urban areas (Schaper et al., 2021). Other agencies, such as the Massachusetts Division of Fisheries and Wildlife, encourage the public to instead landscape with native plants to provide natural sources of food to birds. Currently, maintaining plantings or natural areas for the benefit of wildlife is a far less common activity among wildlife viewers in the U.S. than feeding wild birds (Sinkular et al., 2022), potentially because this activity is less broadly accessible.

Promisingly, people who feed birds are willing to mitigate potential negative effects of feeding through feeder cleaning and other management actions (Dayer et al., 2019). More broadly, bird feeding may have positive effects on conservation action, as previous research shows a strong connection between wildlife viewing and conservation behaviours such as habitat management (Cooper et al., 2015; Grooms et al., 2023; Sinkular et al., 2022). Banning feeding may therefore disrupt the opportunity for positive bird-friendly actions and therefore could ultimately negatively affect wildlife.

Overall, the continued widespread popularity of bird feeding, despite its economic costs at the household level and potential disease consequences for birds, underscores its importance for humans. The effects of bird feeding on humans and birds appear to be far-reaching, emphasizing the need to better understand where, when and how bird feeding influences wild bird populations, disease spread and the well-being of the people involved in these activities. This could be accomplished through broad-scale, accessible participatory science datasets that collect both biological and social science data (Sullivan et al., 2017). Coupled socio-ecological datasets could provide the needed evidence to inform management decisions by agencies in the face of increasing avian disease outbreaks. Incorporation of social science in decision-making, such as through a decision analysis (i.e. adaptive management and structured decision making) approach, could allow wildlife management agencies to quantify the

values and objectives of people, and expose acceptable trade-offs for birds and humans (Gregory & Long, 2009; Robinson et al., 2019).

AUTHOR CONTRIBUTIONS

Ashley A. Dayer, P. Christy Pototsky and Richard J. Hall conceptualized the ideas and designed methodology; P. Christy Pototsky conducted the web search, Ashley A. Dayer, P. Christy Pototsky, Richard J. Hall and Dana M. Hawley led the writing of the manuscript. All authors contributed critically to the drafts and gave final approval for publication.

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CONFLICT OF INTEREST STATEMENT

Greig is the project leader of Project FeederWatch, a citizen science project focused on gathering data about birds at feeding stations. This project receives partial funding from Wild Birds Unlimited.

DATA AVAILABILITY STATEMENT

Not applicable.

ETHICS STATEMENT

Not applicable. No human subjects or animal subjects in this research.

PERMISSION TO REPRODUCE FROM OTHER SOURCES

Not applicable.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Table S1. US state wildlife management agencies implementing statewide or local recommendations/advisories to cease bird feeding activities in response to the presence of avian disease in 2021–2022.

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