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Testimony of Margaret Fowle
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Before the House Committee on Agriculture, Food Resiliency, and Forestry
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Chairman Durfee and distinguished members of the Vermont State Agriculture, Food Resiliency & Forestry Committee, thank you for granting Audubon Vermont the opportunity to testify on H.706, the bill requiring restrictions on neonicotinoids. My name is Margaret Fowle, and I am a Senior Conservation Biologist with Audubon Vermont, a state program of the National Audubon Society. I have been working to restore bird populations in Vermont for over 25 years, with a special focus on agricultural habitats, as well as Peregrine Falcon and Bald Eagle recovery. My testimony supports the proposed legislation.

The National Audubon Society protects birds and the places they need throughout the Americas using science, advocacy, education, and on-the-ground conservation. Audubon's state programs, nature centers, chapters, and partners have a wingspan that reaches millions of people each year to inform, inspire and unite diverse communities in conservation action. In Vermont, Audubon leads a network of nearly 10,000 active members and seven locally affiliated chapters, and thousands of annual visitors, volunteers, and partners throughout the state.

Overview

Birds provide essential ecosystem services such as seed dispersal, pest control, pollination, ecotourism, and are overall indicators of environmental health. Birds also bring us joy and wonder. Vermont leads the nation in the number of residents who enjoy bird watching at an estimated 39%, twice the U.S. average of 20% (U.S Fish and Wildlife Service, 2012). Our state's biodiversity and environmental health also draws in non-residents as wildlife watchers contribute hundreds of millions of dollars to the Vermont state economy each year (Roman and Erickson, 2015).

Tragically, birds in North America are rapidly declining due to threats of climate change, human development, habitat loss, and excessive pesticide use. Species that use farmlands, grasslands, or shrublands and that eat seeds or flying insects are experiencing the strongest and most pervasive declines. Grassland birds have experienced >50% population declines since 1970; flying insect eating bird populations have declined >30% (Rosenberg et al. 2019); and 74% of farmland bird species have experienced breeding population declines (Stanton et al. 2018). In Vermont specifically, we have seen alarming declines in several aerial insect-eating bird species as shown from the first Vermont Breeding Bird Atlas to the second, including a 25% decline in Chimney Swifts, 91% decline in Common Nighthawks, 62% decline in Purple Martins, and 55% decline in Eastern Meadowlarks, which eat both seeds and insects and are now a state-listed endangered species (Renfrew, 2012).

The habitat and diet preferences shared by these species suggest agricultural pesticides, including neonics, are a major contributor to these overall population declines (Geiger et al., 2010; Mineau and Palmer, 2013; Chiron et al., 2014; Tassin de Montaigu and Goulson, 2020). Recent research has directly linked neonics to farmland bird population declines by an average of 3.5% annually, where aquatic neonic contamination was detected (Hallmann et al. 2014). Increases in neonicotinoid use specifically led to statistically significant reductions in bird biodiversity between 2008 and 2014 when other negative impacts on birds were controlled for in the analysis, such as land use, use of non-neonic pesticides, weather conditions during the breeding and winter season, and human population density.

Neonic seed coatings are the most widespread insecticide in Vermont. The upper estimate for neonics applied by seed treatment is more than all other insecticides in the state combined. Most of this use is in corn, and steps to reduce use in this cropping system would make the biggest difference in neonic use and the associated risks to pollinators, birds, and other wildlife.

As someone who has spent a large part of her career restoring birds that suffered declines from insecticides, the issue of the effects of insecticides on birds is a personal one for me. Peregrine Falcons and Bald Eagles nearly went extinct due to the indiscriminate use of the insecticide DDT. Restoration of these species took decades, and they were caught just in time. In Vermont, we now have a thriving population of these bird species as well as other predatory birds that were affected by DDT. This is in large part because DDT has been banned in the US. We do not want to wait until we lose billions more birds before acting.

Effects of neonics on birds

Due to their water solubility, persistence in the environment, toxicity to aquatic insects, and rapid increase in use, neonic insecticides not only threaten human health, but endanger non-target beneficial wildlife and the clean water, soil, and insect and plant resources they depend on for survival. Although aimed at pests, neonics impact birds at both individual and population levels in three main ways: direct mortality through treated seed ingestion, direct significant health problems at sub-lethal doses, and indirectly by decimating their insect food supply and poisoning their habitat.

Direct mortality

Sensitivity to neonics varies among bird species, but scientific literature documents a single treated corn kernel could kill a bird equivalent in size to a Blue Jay (Mineau and Palmer 2013). Corn is the most used and widespread neonic treated seed. Thirty different bird species have been observed picking up treated seeds in Spain (Lopez-Antia et al. 2016), and 78% of 36 wild-caught White-crowned Sparrows exhibited detectable levels of a type of neonic in their bloodstream (Hao et al. 2018). Additionally, several studies suggest predators likely consume carcasses of birds affected by neonics, meaning the chemicals may bioaccumulate in species higher on the food chain that are not directly exposed (Byholm et al. 2018).

Direct, sublethal effects

Sub-lethal effects even at relatively low doses can result in songbirds disoriented and delayed migration, severe neurological convulsions, significant weight loss, and interfere with reproductive success (Eng et al. 2017, Gibbons et al 2015). Suppressed appetites, poor body condition, delayed arrival to breeding grounds, and longer migration stopovers all expose birds to increased mortality risk (studies have shown that as 85% of mortality occurs during migration; Sillett and Holmes 2002) and reduced reproductive success. Not only is reproductive opportunity reduced, but sub-lethal doses of neonics also have direct

effects on fertilization rate, eggshell thickness, developmental abnormalities, and hatching success, as well as reduced chick and adult survival, feeding rates, body mass, immune response, and increased DNA breakage rates (reviewed in Mineau and Palmer 2013, Gibbons et al. 2015). Consistent exposure to similar levels in the wild could lead to reduced productivity and/or survivorship and consequently result in population-level declines.

Indirect effects
Birds are also indirectly impacted when neonics leach into nearby water bodies, where they kill the larvae of non-target insects such as midges and caddis flies, a crucial food source for insect-eating birds—a group experiencing some of the strongest population declines (Goulson et al. 2013, Morrissey et al. 2015). It is well-documented that many invertebrate populations are already suffering steep declines with two-thirds of monitored invertebrate species having declined by 45% on average (Dirzo et al. 2014). Additional losses to insect populations due to neonic exposure will further impact food availability for vulnerable birds. Aquatic macroinvertebrates are especially susceptible to neonics at low concentrations, (Mineau and Palmer 2013, van Dijk et al. 2013, Morrissey et al. 2015). Meanwhile 74 - 81% of global surface water studies report neonic concentrations above toxicity thresholds for aquatic macroinvertebrates (Morrissey et al. 2015). Neonics have been found in Vermont drinking water in runoff from agricultural fields planted in treated corn and soy seeds in Vermont, leading to Lake Champlain from the St. Albans Bay (Shambaugh, 2016). At least 10 of Vermont's designated 17 Important Bird Areas are close in proximity to or receive water from highly used neonic areas in the state.

Conclusion

Due to these impacts, the use of neonicotinoid insecticides – particularly in areas where vulnerable bird species or their prey may encounter neonics – should be greatly reduced or eliminated. Reduction in the use of neonicotinoids and other pesticides in Vermont may help ensure the conservation of vulnerable grassland, farmland, and backyard birds that are already suffering due to habitat loss and the effects of climate change.

For these reasons, Audubon strongly supports H.706 and urges you to vote yes on this proposed legislation.

Thank you again for allowing me to testify today, and should you need any additional information, please contact me at 802-238-0046 or margaret.fowle@audubon.org .

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