July 29, 2022

Submitted via regulations.gov and email

Sharla M. Jennings
National Policy Manager
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
Sharla.M.Jennings@usda.gov

Re: APHIS Strategic Plan Framework, Docket ID: APHIS-2022-0035

Dear Sharla Jennings:

The Animal Welfare Institute, Center for Biological Diversity, Animal Defenders International, Humane Society of the United States, Humane Society Legislative Fund, and Born Free USA thank you for this opportunity to comment on the U.S. Department of Agriculture ("USDA") Animal and Health Inspection Service's ("APHIS") Strategic Plan Framework ("Framework").

In its announcement seeking stakeholder input on the Framework, APHIS requested comments in response to four specific questions.[1] The questions and our responses are below.

1) **Are your interests represented in the plan?**

A key interest and concern of our organizations is the threat that transmission of zoonotic diseases—in particular the severe acute respiratory syndrome coronavirus 2 ("SARS-CoV-2") virus—to and from farmed mink poses to the health and safety of humans, mink, and wildlife.

[1] *APHIS Seeking Stakeholder Insight About Strategic Plan Framework*, ANIMAL PLANT HEALTH INSPECTION SERV., U.S. DEP'T OF AGRIC. (June 2, 2022), https://www.aphis.usda.gov/aphis/newsroom/stakeholder-info/sa_by_date/sa-2022/strategic-plan-framework-insight.

While several of the Framework's goals discuss disease transmission generally, the document does not mention SARS-COV-2, the mink farming industry, or the risks that it presents to workers, other animals, or wildlife nearby. And, because the agency has not made the draft plan itself available for public comment, it is impossible to know whether or to what extent the draft plan might specifically address those topics. Thus, our comments focus on the importance of monitoring and preventing SARS-CoV-2 outbreaks on mink farms.

2) Are there opportunities for APHIS to partner with others to achieve the goals and objectives?

We urge APHIS to include our organizations, and others in the animal protection and wildlife conservation community, in its outreach and partnerships. Our groups can offer expertise and resources, and we want to see and, where possible, help APHIS succeed in its goals to reduce the spread of disease to humans and animals.

3) Are there other trends for which the agency should be preparing?

We encourage APHIS to identify "Zoonotic Disease Risk" as an additional trend for which the agency should be preparing. The Framework lists "Rising Global Health Threats" as a top-10 trend, and it briefly mentions that one result of climate change will be an increase in the spread of disease.[2] But the growing threat of emerging and mutating infectious diseases—most of which are zoonotic[3]—warrants specific recognition. Zoonotic disease is on the rise, and health officials have warned that humanity has "entered a pandemic era"—one in which we are experiencing more "unexpected, novel, and devastating pandemic disease[s]."[4] Observers have referred to this new era as the "Pandemicene."[5] As one publication observed, pandemic and regional epidemic disease outbreaks will occur with increasing frequency as a result of ongoing, destructive human activities that facilitate the spread of pathogens:

> Humans are pushing further into previously uninhabited areas, triggering a cascade of changes in the natural world. Rapid deforestation in Africa and South America pushes wildlife toward areas where people live and work, increasing the risk of interaction and disease transmission. People in many countries consume meat and fur of wild animals—the cause of several spillover virus outbreaks, including SARS, monkeypox, and two strains of Ebola. . . . In the jet age, people infected with a novel virus in one country can spread it to the other side of the

[2] ANIMAL PLANT HEALTH INSPECTION SERV., U.S. DEP'T OF AGRIC., APHIS STRATEGIC PLAN FRAMEWORK 7.
[3] ANIMAL PLANT HEALTH INSPECTION SERV., U.S. DEP'T OF AGRIC., APHIS STRATEGIC PLAN FRAMEWORK 3; David M. Morens & Anthony S. Fauci, *Emerging Pandemic Diseases: How we got to COVID-19*, 182 CELL 1077, 1079 (2020).
[4] David M. Morens & Anthony S. Fauci, *Emerging Pandemic Diseases: How we got to COVID-19*, 182 CELL 1077 (2020).
[5] The Week Staff, *Welcome to the 'Pandemicene'*, THE WEEK (June 26,2022), https://theweek.com/covid-19/1014609/welcome-to-the-pandemicene; Ed Young, *We Created the "Pandemicene'*, THE ATLANTIC (April 28, 2022), https://www.theatlantic.com/science/archive/2022/04/how-climate-change-impacts-pandemics/629699/.

> globe in a matter of hours. And climate change is poised to make the problem exponentially worse over the next 50 years.[6]

Intensive animal agriculture presents a particular threat. According to the United Nations Environment Programme ("UNEP"), the "unsustainable agricultural intensification" of farm animal production is considered one of seven major anthropogenic drivers of zoonotic disease emergence.[7] Similarly, according to a 2013 publication in the Proceedings of the National Academy of Sciences, "strong evidence [links] modern farming practices and intensified systems . . . to disease emergence and amplification."[8] In addition, a 2021 report from the Food and Agriculture Organization of the United Nations identified concentrated animal feeding operations as having "historically been associated with the spread of zoonoses," and that "[f]rom a biological security perspective, individuals associated with highly mechanized/intensive livestock production face an increased risk of catching zoonotic diseases."[9] These are just a handful of the many reports that have identified concentrated animal feeding operations as causing a significant risk for the development, mutation, and spread of zoonotic diseases, including diseases with pandemic potential. And all of the factors that led UNEP to identify the intensification of farm animal agriculture as a major driver of zoonotic disease emergence (including concentration, stress-induced immune system suppression, genetic homogeneity, and poorly regulated, dirty environments) are also present in mink farming operations.[10]

4) Are there additional items APHIS should consider for the plan?

There are a number of specific items that we believe APHIS should consider as it develops its new strategic plan. As discussed in more detail below, those items relate to preventing and combating the spread of zoonotic diseases on mink fur farms. Specifically, we discuss: 1) the development of an effective early warning system for SARS-CoV-2 outbreaks on minkfarms; 2) the comprehensive monitoring of potential SARS-CoV-2 transmission pathways to and from mink farms; and 3) restrictions APHIS should consider imposing on the importation and interstate movement of farmed mink to reduce the spread of SARS-CoV-2 to humans, captive and wild mink, and other wildlife.

I. APHIS's Strategic Plan Should Commit to Developing an Effective Early Warning System for Mink Fur Farms.

To prevent the spread of SARS-CoV-2, and to protect human health and safety, it is imperative that APHIS create an effective early warning system for mink farms. As the Framework

---

[6] The Week Staff, *Welcome to the 'Pandemicene'*, THE WEEK (June 26,2022), https://theweek.com/covid-19/1014609/welcome-to-the-pandemicene.
[7] UNEP & INT'L LIVESTOCK RSCH. INST., PREVENTING THE NEXT PANDEMIC: ZOONOTIC DISEASES AND HOW TO BREAK THE CHAIN OF TRANSMISSION 15 (2020).
[8] Bryony A. Jones et al., *Zoonosis emergence linked to agricultural intensification and environmental change*, 110 PNAS 8399 (2013).
[9] FAO, UNDP & UNEP, A MULTI-BILLION-DOLLAR OPPORTUNITY: REPURPOSING AGRICULTURAL SUPPORT TO TRANSFORM FOOD SYSTEMS 7, 71 (2021), http://www.fao.org/3/cb6562en/cb6562en.pdf.
[10] *See, e.g.*, UNEP & INT'L LIVESTOCK RSCH. INST., PREVENTING THE NEXT PANDEMIC: ZOONOTIC DISEASES AND HOW TO BREAK THE CHAIN OF TRANSMISSION 15 (2020).

acknowledges, "Early detection and response to zoonotic and emerging diseases is essential in limiting or preventing human outbreaks."[11] It explains that "APHIS will build an early warning system so steps can be taken sooner to prevent or limit the zoonotic disease outbreaks."[12] Last fall, APHIS initiated one component of that system, called the Mink SARS-CoV-2 Transmission Avoidance and Monitoring Plan ("Mink STAMP") program.[13] While few details about the program are publicly available, APHIS's One Health website explains that the program is a "voluntary cooperative federal-state-industry effort to actively monitor for SARS-CoV-2 infection on mink farms and minimize risk of transmission of the virus between mink and human caretakers on U.S. mink farms."[14] The program "offers education, incentives, and infrastructure support for active SARS-CoV-2 monitoring and response, including surveillance of susceptible wildlife populations on or near mink farms; multimedia, multi-lingual biosecurity training materials for mink farm workers; and recommendations for herd management."[15]

We appreciate the Mink STAMP program's emphasis on active monitoring. Testing of farmed mink for SARS-CoV-2 must be done frequently and proactively. This is because infected mink may be asymptomatic and appear healthy, even if they are infected and pose a risk of transmission. For example, after testing farmed mink in Denmark, Hammer et al. (2021) reported that many infections "occurred with little clinical disease or increase in death, making it difficult to detect the spread of infection; thus, mink farms could represent a serious, unrecognized animal reservoir for SARS-CoV-2."[16] APHIS and CDC appear to have recognized this risk: In previous statements and guidance documents, the agencies stated that they did "not recommend routine testing of animals for this virus at this time;"[17] however, in their most recent, updated guidance, the agencies removed that recommendation and instead encouraged the testing of farmed mink, whether the animals have clinical signs consistent with COVD-19 or not.[18]

The Mink STAMP program's features are laudable; however, a major shortcoming of the program is that participation is voluntary.[19] When the undersigned organizations spoke with APHIS officials in February, the officials informed us that, as of that time, only mink farms in a single state—Oregon—had begun participating in the program.[20] And that appeared to be

[11] ANIMAL PLANT HEALTH INSPECTION SERV., U.S. DEP'T OF AGRIC., APHIS STRATEGIC PLAN FRAMEWORK 3.
[12] *Id.*
[13] *See One Health – Building an Early Warning System for SARS-CoV-2 and Other Animal Diseases*, ANIMAL PLANT HEALTH INSPECTION SERV., U.S. DEP'T OF AGRIC., https://www.aphis.usda.gov/aphis/ourfocus/onehealth/one-health-early-warning-system.
[14] *Id.*
[15] *Id.*
[16] Anne Sofie Hammer et al., *SARS-CoV-2 Transmission between Mink (*Neovison vison*) and Humans, Denmark*, 27 EMERGING INFECTIOUS DISEASES 547 (2021); *see also* M. Pomorska-Mól et al., *Review: SARS-CoV-2 Infection in Farmed Minks – an Overview of Current Knowledge on Occurrence, Disease and Epidemiology*, ANIMAL, June 2021, at 1.
[17] U.S. DEP'T OF AGRIC., FAQ ON ANIMAL CORONAVIRUS TESTING 1 (2020), https://www.aphis.usda.gov/animal_health/one_health/downloads/faq-public-on-companion-animal-testing.pdf.
[18] *Evaluation for SARS-CoV-2 Testing in Animals*, CTR. FOR DISEASE CONTROL & PREVENTION, U.S. DEP'T OF HEALTH & HUM. SERV., (Mar. 30, 2022), https://www.cdc.gov/coronavirus/2019-ncov/animals/animal-testing.html, Table 1, Criteria E.
[19] *One Health – Building an Early Warning System for SARS-CoV-2 and Other Animal Diseases*, ANIMAL PLANT HEALTH INSPECTION SERV., U.S. DEP'T OF AGRIC., https://www.aphis.usda.gov/aphis/ourfocus/onehealth/one-health-early-warning-system ("APHIS is launching a voluntary cooperative federal-state-industry effort . . . .").
[20] Communication with APHIS officials (Feb. 24, 2022).

because a temporary administrative order issued by the Oregon Department of Agriculture in May 2021 essentially required their participation: it stated, "Any person holding captive mink in Oregon must participate in surveillance testing for SARS-CoV-2 according to guidelines established by the Oregon Department of Agriculture in cooperation with the U.S. Department of Agriculture."[21] However, the rule only remained in effect until November 22, 2021.[22] Thus, it is unclear whether or how long the Oregon mink farms will continue to participate in the program. Further, the APHIS officials with whom our organizations spoke were unsure if mink farms in other states would participate.[23] Indeed, in Utah, for example, mink farmers have been resistant to allowing state health officials onto their property, even for SARS-CoV-2 testing.[24] In more recent correspondence, APHIS indicated that Oregon remains the only state to have participated in the program thus far.[25]

In order to be effective, an early warning system *must* include the participation of states and mink farms in the active monitoring, surveillance, and testing of farmed mink. If states or mink farmers prove unwilling to participate in the Mink STAMP program or otherwise voluntarily monitor or test their animals, APHIS should exercise its statutory authority to require that such testing be done. The Animal Health Protection Act ("AHPA") authorizes the Secretary of Agriculture to "carry out operations and measures to detect, control, or eradicate any pest or disease of livestock (including the drawing of blood and diagnostic testing of animals), including animals at a slaughterhouse, stockyard, or other point of concentration." 7 U.S.C. § 8308(a). The Act defines "livestock" as "all farm-raised animals," 7 U.S.C. 8302(10), which includes farmed mink. Thus, APHIS[26] has the authority to enact measures, including diagnostic testing, to actively detect and prevent the presence of the SARS-CoV-2 virus on mink farms.

Whether they are performed voluntarily through the Mink STAMP program, or whether APHIS requires them pursuant to its authority under the AHPA, it is critical that an early warning system for mink farms and SARS-CoV-2 include, at minimum, the following measures:

- At least weekly testing (using the least invasive testing methods) of a large enough sample size of the animals being raised on a given fur farm to determine with at least 95 percent confidence that no animals in the population are infected (prioritizing the testing of animals that appear sick or have already died);[27]
- At least weekly testing of all fur farm workers and others who visit or come into contact with fur farms;

[21] Mink Vaccine Surveillance, Or. Admin. R. § 603-011-0680 (2021).
[22] *Id.*
[23] Communication with APHIS officials (Feb. 24, 2022).
[24] Sonia Shah, *Animals That Infect Humans are Scary. It's Worse When We Infect Them Back*, N.Y. TIMES (Jan. 25, 2022), https://www.nytimes.com/2022/01/19/magazine/spillback-animal-disease.html.
[25] Communication with APHIS officials (July 25, 2022).
[26] The Secretary of Agriculture has delegated its authority to carry out the AHPA to the Under Secretary for Marketing and Regulatory Programs. *See* 7 C.F.R. § 2.22(a)(2)(xxxii). The Under Secretary has, in turn, delegated its authority to APHIS. *See* 7 C.F.R. § 2.80(a)(37); *see also Humane Society of the United States v. U.S. Dept. of Agriculture*, No. 20-03258, 2021 WL 1593243, at *2.
[27] *See* Anette Boklund et al., Eur. Food Safety Auth. & Eur. Ctr. for Disease Prevention and Control, *Monitoring of SARS-CoV-2 Infection in Mustelids*, 19 EFSA JOURNAL 1, 42 (2021).

- Immediate reporting to APHIS and CDC of farmed mink showing signs of possible SARS-CoV-2 infection, including "increased mortality, respiratory or gastrointestinal signs or reduction in feed intake,"[28] or any other clinical signs consistent with SARS-CoV-2 infection in animals;[29]
- Immediate testing of any fur farm workers who show, or whose household members show, signs of possible SARS-CoV-2 infection, including "fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea or vomiting, and diarrhea;"[30]
- If any fur farm workers or animals test positive, immediate:
    - Quarantine of the farm workers and/or the farm;
    - Reporting of the positive test results and any other relevant information to local health authorities, wildlife management agencies, and the public;
    - Investigations by APHIS and CDC to determine whether or to what extent other farm workers and the mink population on the farm are infected;
    - Investigations by APHIS, CDC, and wildlife management officials to determine whether or to what extent the virus is present in any domestic animals, escaped mink, wild mink, or other potentially susceptible wildlife on or near (within, for example, a 40-kilometer radius of[31]) the infected farm;
    - Recommendation to relevant state and federal wildlife officials that the recreational trapping of mink and other potentially susceptible wildlife—particularly mustelids[32]—be closed in the area surrounding the infected farm; and
    - Genetic analysis of the virus "to characterize the virus, to detect possible virus mutations and to identify the origin and the source of the virus (e.g. spread between different populations)."[33]

In addition, APHIS should establish increased reporting obligations to minimize escapes of farmed mink into the wild and exposure of wild mink and other wildlife populations to confined mink. Such obligations should include written confirmation that:

---

[28] *Id.* at 41.
[29] *Evaluation for SARS-CoV-2 Testing in Animals*, CTR. FOR DISEASE CONTROL AND PREVENTION, U.S. DEP'T OF HEALTH & HUM. SERV. (Mar. 30, 2022), https://www.cdc.gov/coronavirus/2019-ncov/animals/animal-testing.html.
[30] CDC, *COVID-19: Symptoms of COVID-19*, https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html.
[31] *See* A.G. Kidd et al., *Hybridization Between Escaped Domestic and Wild American Mink (*Neovison vison*)*, 18 MOLECULAR ECOLOGY 1175 (2009).
[32] Numerous researchers have cautioned that members of the family Mustelidae may be particularly susceptible to the SARS-CoV-2 virus, and efforts to monitor them should be prioritized. *See, e.g.*, Tessa Prince et al., *SARS-CoV-2 Infections in Animals: Reservoirs for Reverse Zoonosis and Models for Study*, VIRUSES, 13, 494 (2021) at 4; Costanza Manes et al., *Could Mustelids spur COVID-19 into a panzootic?*, 56 VETERINARIA ITALIANA 65 (2020); Khan Sharun et al., *SARS-CoV-2 in Animals: Potential for Unknown Reservoir Hosts and Public Health Implications*, 41 VETERINARY QUARTERLY 181, 191 (2021).
[33] Anette Boklund et al., Eur. Food Safety Auth. & Eur. Ctr. for Disease Prevention and Control, *Monitoring of SARS-CoV-2 Infection in Mustelids*, 19 EFSA JOURNAL 1, 43 (2021).

- The facility is constructed (or that additional protections are put in place should construction be subpar) to minimize escapes and interactions of confined mink with wild mink or other wildlife populations;
- There are adequate security and safety programs and procedures in place to minimize the possibility of escape or entry onto the property of wild mink or other wildlife;
- There is frequent, detailed record keeping to aid in tracking of confined animals and humane recovery of escaped animals;
- There are adequate procedures, equipment and trained staff to maximize humane capture of escaped animals;
- Adequate veterinary care is provided to identify and minimize the spread of diseases; and
- The owner of the facility has a record of providing proper, needed care of animals and is in compliance with applicable wildlife laws.

Importantly, all information gathered by APHIS while conducting and regulating such activities should be promptly shared with the public, the scientific community, state and federal wildlife and public health agencies, and the mink farming industry (including mink farmers, and any entities or facilities involved in the rendering, disposal, or transportation of live mink, mink pelts, or mink carcasses). Collectively, these measures would provide a substantial foundation for an early warning system specific to mink operations. Our organizations would welcome the opportunity to work with APHIS to develop additional measures that could also be taken to minimize the risk of transmission to farmed animals, humans, and other species.

II. APHIS's Strategic Plan Should Explain How the Agency Will Monitor All Potential SARS-CoV-2 Pathways.

To protect public, animal, and ecosystem health, APHIS must carefully consider and monitor all of the different pathways or vectors by which the SARS-CoV-2 virus could be transmitted to, within, and from mink farms. The Framework rightly emphasizes the importance of protecting humans and animals from disease.[34] Goals 2, 3, and 5 all contain objectives focused on preventing and managing foreign and domestic diseases.[35] For example, Objective 2.1 is to "[s]trenghten prevention, surveillance and monitoring, and response to emerging and zoonotic diseases."[36] Objectives 3.1, 3.2, and 3.3 focus on preventing plant and animal diseases from entering the country, managing those that have already become established, and ensuring effective emergency preparedness and response capabilities.[37] Objective 5.1 aims to "[s]trengthen wildlife disease prevention, surveillance, and response."[38]

One way APHIS intends to improve its disease management is by "strengthen[ing] pathway analysis"[39]—that is, by determining potential pathways or vectors by which harmful diseases

---

[34] ANIMAL PLANT HEALTH INSPECTION SERV., U.S. DEP'T OF AGRIC., APHIS STRATEGIC PLAN FRAMEWORK 3-5.
[35] *Id.*
[36] *Id.* at 3.
[37] *Id.* at 4.
[38] *Id.* at 5.
[39] *Id.* at 3.

could be introduced or spread.[40] As APHIS expands and strengthens its pathway analysis, it is critical that the agency carefully consider and study all of the ways by which the SARS-CoV-2 virus could be transmitted to and from farmed mink. As discussed in more detail below, mink farms could cause or result in transmission of the virus to humans, domestic animals, or wildlife through a number of different pathways. Those include live mink (both caged and escaped), other animals that may come into contact with mink or mink farms, mink feces, wastewater surface water runoff from mink farms, mink carcasses, and mink fur.

A. Live Mink

Both caged and escaped mink could contribute to the spread of SARS-CoV-2. It is clear that farmed mink can become infected with SARS-CoV-2 and that the virus can spread rapidly among them. There have been outbreaks of SARS-CoV-2 on at least 435 mink farms in North America and Europe,[41] including at least 18 in the United States.[42] More than 20,000 farmed mink have died from the disease in the United States alone;[43] millions more have died from the disease or been culled in Europe in an attempt to prevent the spread of the disease.[44] All 11 escaped mink that were captured by state and federal officials near mink farms in Utah in 2020 tested positive for SARS-CoV-2 antibodies, suggesting recent infection.[45] Of three escaped mink captured near mink farms in Oregon in 2020 and 2021, two tested positive for SARS-CoV-2.[46] Of 12 mink captured near mink farms in British Columbia, three (all escaped) were infected with SARS-CoV-2.[47] Indeed, in one of its guidance documents, APHIS warns that mink producers should use "extreme caution" when introducing new mink to a herd because "[n]ew animals may introduce disease problems into a mink farm, including SARS-CoV-2."[48] Likewise, Fur

---

[40] *See, e.g.*, *Risk Identification*, ANIMAL PLANT HEALTH INSPECTION SERV., U.S. DEP'T OF AGRIC. (Dec. 7, 2021), https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/SA-Epidemiology-AnimalHealth-CEAH/Risk+Identification.

[41] Florence Fenollar et al., *Mink, SARS-CoV-2, and the Human-Animal Interference*, FRONTIERS IN MICROBIOLOGY, Apr. 2021, at 5-6; OIE, SARS-COV-2 IN ANIMALS – SITUATION REPORT 1-2 (2021); JIM KEEN, MINK FARMING & SARS-COV-2 14 (2022); Hon S. Ip et al., *An Opportunistic Survey Reveals an Unexpected Coronavirus Diversity Hotspot in North America*, VIRUSES, at 8 (Oct. 2021).

[42] Florence Fenollar et al., *Mink, SARS-CoV-2, and the Human-Animal Interference*, FRONTIERS IN MICROBIOLOGY, Apr. 2021, at 6; OIE, SARS-COV-2 IN ANIMALS – SITUATION REPORT 1-2 (2021); JIM KEEN, MINK FARMING & SARS-COV-2 15 (2022); *One Health - SARS-CoV-2 in Animals*, ANIMAL PLANT HEALTH INSPECTION SERV., U.S. DEP'T OF AGRIC., https://www.aphis.usda.gov/aphis/ourfocus/onehealth/one-health-sarscov2-in-animals.

[43] Florence Fenollar et al., *Mink, SARS-CoV-2, and the Human-Animal Interference*, FRONTIERS IN MICROBIOLOGY, Apr. 2021, at 7; *Confirmed Cases of SARS-CoV-2 in Animals in the United States*, U.S. DEP' AGRIC. ANIMAL & PLANT HEALTH INSPECTION SERV., https://www.aphis.usda.gov/aphis/dashboards/tableau/sars-dashboard (Sept. 13).

[44] Florence Fenollar et al., *Mink, SARS-CoV-2, and the Human-Animal Interference*, FRONTIERS IN MICROBIOLOGY, Apr. 2021, at 2, 6.

[45] Susan A. Shriner et al., *SARS-CoV-2 Exposure in Escaped Mink, Utah, USA*, 27 EMERGING INFECTIOUS DISEASES 988, 988 (Mar. 2021).

[46] Danny Peterson, *3 mink caught outside quarantined farm; 2 test SARS-CoV-2 positive*, KOIN (Jan. 13, 2021), https://www.koin.com/news/health/coronavirus/3-mink-caught-outside-quarantined-farm-2-test-sars-cov-2-positive/.

[47] Talia Strang et al., *SARS-CoV-2 wildlife surveillance surrounding mink farms in British Columbia, Canada*, 48 CANADA COMMUNICABLE DISEASE REP. 252, 256 (2022).

[48] APHIS, RESPONSE & CONTAINMENT GUIDELINES: INTERIM GUIDANCE FOR ANIMAL HEALTH AND PUBLIC HEALTH OFFICIALS MANAGING FARMED MINK AND OTHER FARMED MUSTELIDS WITH SARS-COV-2 4 (2020), https://www.aphis.usda.gov/publications/animal_health/sars-cov-2-mink-guidance.pdf.

Commission USA operating guidelines acknowledge that a "main source of farm contamination is purchased animals."[49] The CDC even cautions that "[c]ar and truck tires, caging, and equipment can harbor viruses and other germs," and that mink farm workers traveling to other mink farms should therefore "clean and disinfect these items before returning to their own farms."[50]

It is also clear that infected farmed mink can transmit the virus to humans. Mink-to-human spread of SARS-CoV-2 has been reported in the Netherlands,[51] Denmark,[52] and Poland.[53] It has also likely occurred in the United States. According to the CDC, "Investigations found that mink from a Michigan farm and a small number of people were infected with SARS-CoV-2 that contained unique mink-related mutations (changes in the virus's genetic material). This suggests mink-to-human spread might have occurred."[54] In April, the CDC confirmed that, among the four people infected, two had no connection to mink farms, suggesting that community spread had occurred.[55]

Further, a recent report from the Statens Serum Institut in Denmark estimated that, without more robust preventive measures, there is a high likelihood that if the country's mink farming industry is allowed to resume in 2023, farmed mink will again transmit the SARS-CoV-2 virus to humans. Specifically, the report calculated that, unless much more effective preventive measures than those used in 2020 are put in place, there is an 80 to 100 percent probability that SARS-CoV-2 would spread from an infected employee to a susceptible mink herd; and, in turn, there is a 40 to 90 percent probability that a mink herd infected with SARS-CoV-2 would transmit the virus to a susceptible mink farm employee.[56]

In addition, because of the proximity of many mink farms to wild mink habitat, it is likely that escaped mink could transmit the virus to wild mink. As identified above, in Utah, Oregon, and British Columbia, captured free-ranging mink have tested positive for SARS-CoV-2. In Utah,

---

[49] FUR COMM'N USA, STANDARD GUIDELINES FOR THE OPERATION OF MINK FARMS IN THE UNITED STATES BOOK 3: BIOSECURITY PROTOCOLS FOR MINK FARMS IN THE UNITED STATES 4 (2019).

[50] CDC, RESPONSE & CONTAINMENT GUIDELINES: INTERIM GUIDANCE FOR ANIMAL HEALTH AND PUBLIC HEALTH OFFICIALS MANAGING FARMED MINK AND OTHER FARMED MUSTELIDS WITH SARS-COV-2 4 (2020), https://www.aphis.usda.gov/publications/animal_health/sars-cov-2-mink-guidance.pdf.

[51] Bas B. Oude Munnink et al., *Jumping Back and Forth: Anthropozoonotic and Zoonotic Transmission of SARS-CoV-2 on Mink Farms*, BIORXIV, Sept. 2020, at 21.

[52] Anne Sofie Hammer et al., *SARS-CoV-2 Transmission Between Mink (Neovison vison) and Humans, Denmark*, 27 EMERGING INFECTIOUS DISEASES 547, 550 (2021).

[53] Lukasz Rabalski et al., *Zoonotic Spillover of SARS-CoV-2: Mink-Adapted Virus in Humans*, BIORXIV, Mar. 2021, at 7.

[54] *COVID-19: Animals & COVID-19*, CDC (Aug. 5, 2021), https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/animals.html.

[55] Emily Anthes, *The Michigan Mink Mystery: How Did an Interspecies Outbreak Unfold?* N.Y. TIMES (May 22, 2022), https://www.nytimes.com/2022/05/22/health/coronavirus-mink-michigan-spillover.html.

[56] STATENS SERUM INST., Updated Assessment of the Risk to Human Health in the Case of Resumed Mink Herds from 1 January 2023, 8 (May 3, 2022), https://www.ssi.dk/-/media/arkiv/subsites/covid19/risikovurderinger/2022/vurdering-af-risikoen-for-den-humane-sundhed-ved-genoptaget-minkhold-fra-2023-03052022.pdf?la=da#:~:text=Sundhedsministeriet%20(SUM)%20har%20den%203,januar%202023.

one of the trapped infected mink is believed to have been a wild mink that caught the virus.[57] Scientists concluded through genome sequencing that the wild Utah mink likely became infected from an outbreak at a nearby commercial mink farm.[58]

While information about the specific locations of fur farms is generally unavailable to the public, the states in which mink farms are located all fall within the range of native mink.[59] Mink farms are often located in rural areas,[60] increasing the likelihood that escaped mink could come into contact with wild mink. They are also often located near "good mink habitat."[61] In Utah, for example, "mink farms often overlap with designated critical mink habitats."[62] This means that escaped mink in those areas may not have to travel far to encounter wild mink.

Further, farmed mink can escape, survive, and spread. When they do, they can interact with wild mink in a variety of ways that would facilitate the spread of the virus:

> [L]ike other mustelids [mink] deposit feces at prominent marking spots that are investigated by neighbors (Hutchings and White 2000); such behaviors could facilitate viral transmission. In addition, during the mating season males will visit multiple females (Macdonald *et al*. 2015), and there is widespread and sometimes extensive movement of both males and females during the autumn when the young-of-the-year disperse from their natal territory (e.g. Oliver *et al*. 2016); both of these behaviors would also potentially facilitate viral spread if movements involve infected individuals.[63]

Indeed, escaped mink readily mate with wild mink, creating high-risk conditions for disease transmission.[64] This is troubling because of the impact that the virus could have on native mink populations. As Kidd et al. (2009) observed, one of the ways escaped mink could cause declines

---

[57] Wufei Yu, *Why Utah's Wild Mink COVID-19 Case Matters*, HIGH COUNTRY NEWS (Jan. 20, 2021), https://www.hcn.org/issues/53.3/south-wildlife-why-utahs-wild-mink-covid-19-case-matters.
[58] James Gorman, *One Wild Mink Near Utah Fur Farms Tests Positive for Virus*, N.Y. TIMES (Dec. 15, 2020), https://www.nytimes.com/2020/12/15/science/covid-wild-mink-utah.html.
[59] Lauren A. Harrington et al., *Wild American Mink (Neovison vison) May Pose a COVID-19 Threat*, 19 FRONTIERS IN ECOLOGY & THE ENV'T 266, 266 (2021).
[60] *See e.g.*, Kate Golden, *Wisconsin's No. 1 mink farming industry now seen as a COVID-19 risk*, WIS. WATCH (Jan. 30, 2021), https://wisconsinwatch.org/2021/01/wisconsins-no-1-mink-farming-industry-now-seen-as-a-covid-19-risk/; Lauren A. Harrington et al., *Wild American Mink (Neovison vison) May Pose a COVID-19 Threat*, 19 FRONTIERS IN ECOLOGY & THE ENV'T 266, 266 (2021).
[61] Jeff Bowman et al., *Assessing the Potential for Impacts by Feral Mink on Wild Mink in Canada*, 139 BIOLOGICAL CONSERVATION 12, 16 (2007).
[62] Susan A. Shriner et al., *SARS-CoV-2 Exposure in Escaped Mink, Utah, USA*, 27 EMERGING INFECTIOUS DISEASES 988, 989 (2021).
[63] Lauren A. Harrington et al., *Wild American Mink (Neovison vison) May Pose a COVID-19 Threat*, 19 FRONTIERS IN ECOLOGY & THE ENV'T 266, 266 (2021) (italics in original).
[64] *See, e.g.*, A.G. Kidd et al., *Hybridization Between Escaped Domestic and Wild American Mink (Neovison vison)*, 18 MOLECULAR ECOLOGY 1175, 1184 (2009).

in wild mink populations is through the introduction of highly infectious, fatal diseases.[65] It is also concerning because wild mink could in turn spread the virus (potentially in a mutated and more transmissible or dangerous form) to humans: wild mink are commonly caught, killed, and handled by recreational trappers. For instance, in Wisconsin alone, where there were 67 mink farms as of 2017, 1,196 trappers captured 3,875 mink during the 2020-2021 trapping season.[66] Hundreds more mink were trapped in recent years in Utah,[67] Idaho,[68] and Oregon,[69] where, as of 2017, there were 55, 23, and 17 mink farms, respectively.[70]

B. Other Animals

Farmed mink may also transmit the virus to other wild animals, which may in turn spread the disease further. As the Fur Commission operating guidelines warn, "Many disease outbreaks [on mink farms] have been shown to have been transmitted by wildlife (raccoons, skunks, rodents, birds, feral cats, etc.)" that have accessed mink farms.[71] If these species are capable of accessing mink farms and transmitting diseases to mink, they may also be capable of accessing mink farms and becoming infected by diseased mink or fomites that may be contaminated with SARS-CoV-2 (such as feed, bedding material, or manure). Once infected, they could in turn transmit the virus to conspecifics or other species. Similarly, natural predators of mink, such as foxes, coyotes, wolves, bobcats, lynx, hawks, eagles, and great horned owls,[72] could prey on an escaped, infected mink and subsequently transport or transmit the virus.

In addition, some species not known to be susceptible to infection may nonetheless serve as mechanical vectors. For example, Boklund et al. (2021) detected low levels of SARS-CoV-2 on the foot of a seagull that had foraged beneath the cages of a mink farm in Denmark.[73] This raised the possibility that the seagull could transport the virus to another location and potentially transmit the virus to other animals. Species of native terrestrial wildlife in the United States that are or may be susceptible to SARS-CoV-2 infection include mink and other mustelids,[74] white-

---

[65] A.G. Kidd et al., *Hybridization Between Escaped Domestic and Wild American Mink (Neovison vison)*, 18 MOLECULAR ECOLOGY 1175, 1184 (2009).
[66] BRIAN DHUEY & SHAWN ROSSLER, FUR TRAPPER SURVEY 4-5 (2019-2020).
[67] UTAH DNR, UTAH FURBEARER ANNUAL REPORT 2020-2021 5, https://wildlife.utah.gov/pdf/annual_reports/furbearer/harvest_20-21.pdf
[68] IDAHO DEP'T FISH & GAME, SURVEYS AND INVENTORIES FY2019 STATEWIDE REPORT: FURBEARER 9 (2020), https://collaboration.idfg.idaho.gov/WildlifeTechnicalReports/Furbearer%20Statewide%20FY2019.pdf.
[69] ODFW, OREGON FURTAKER LICENSE AND HARVEST DATA 16 (2018), https://www.dfw.state.or.us/resources/hunting/small_game/docs/Furtaker_License_and_Harvest_Data.pdf.
[70] *Quick Stats*, NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC., https://quickstats.nass.usda.gov/results/4E128EAC-D669-34E9-8BC2-13426874CB34.
[71] JOHN S. EASLEY D.M.V., FUR COMM'N USA, STANDARD GUIDELINES FOR THE OPERATION OF MINK FARMS IN THE UNITED STATES BOOK 3: BIOSECURITY PROTOCOLS FOR MINK FARMS IN THE UNITED STATES 3 (2019).
[72] *See, e.g.*, *American Mink*, ALASKA DEPT. OF FISH & GAME, http://www.adfg.alaska.gov/index.cfm?adfg=americanmink.printerfriendly; *Mink Biology: What is a Mink?*, FUR COMM'N USA, https://furcommission.com/mink-biology/.
[73] Anette Boklund et al., *SARS-CoV-2 in Danish Mink Farms: Course of the Epidemic and a Descriptive Analysis of the Outbreaks in 2020*, 11 ANIMALS 164 (2021).
[74] Florence Fenollar et al., *Mink, SARS-CoV-2, and the Human-Animal Interference*, FRONTIERS IN MICROBIOLOGY, Apr. 2021; Khan Sharun et al., *SARS-CoV-2 in Animals: Potential for Unknown Reservoir Hosts and Public Health Implications*, 41 VETERINARY QUARTERLY 181 (2021).

tailed deer,[75] mule deer,[76] mountain lions,[77] brown bears,[78] raccoons,[79] rabbits,[80] red foxes,[81] skunks,[82] bats,[83] bushy-tailed woodrats,[84] thirteen-lined ground squirrels,[85] ermines,[86] pikas,[87] prairie voles,[88] white-footed mice,[89] and deer mice.[90]

The susceptibility of deer mice is particularly concerning. They are "abundant in regions where American mink (*Neovison vison*) are farmed, raising the possibility of contact with infected American mink or contaminated fomites."[91] This is worrisome because researchers have demonstrated that deer mice are not only susceptible to experimental infection of SARS-CoV-2, but can spread the virus to other deer mice.[92] They may also be able to spread it to any of the dozens of other members of the *Peromyscus* genus.[93] Further, they may be able to transmit it to

---

[75] Jeffrey C. Chandler et al., *SARS-CoV-2 Exposure in Wild White-Tailed Deer (Odocoileus virginianus)*, BIORXIV, July 2021, at 1.
[76] World Organization for Animal Health (OIE), U.S. Follow-Up Report 33, 1-3, 29 (March 25, 2022).
[77] *OIE Members have been keeping the OIE updated on any investigations or outcomes of investigations in animals:*, OIE, https://www.oie.int/en/what-we-offer/emergency-and-resilience/covid-19/#ui-id-3 (last updated Oct. 12, 2021).
[78] Ilya R. Fischoff et al., *Predicting the zoonotic capacity of mammals to transmit SARS-CoV-2*, Proc. R. Soc. B 288:20211651, Oct. 2021, Supplementary Figure 6.
[79] Raquel Francisco et al., *Experimental Susceptibility of North American Raccoons (Procyon lotor) and Striped Skunks (Mephitis mephitis) to SARS-CoV-2*, BIORXIV, Mar. 2021, at 1.
[80] Anna Z. Mykytyn et al., *Susceptibility of Rabbits to SARS-CoV-2*, EMERGING MICROBES & INFECTIONS, Jan. 2021, at 1.
[81] Junwen Luan et al., *Spike Protein Recognition of Mammalian ACE2 Predicts the Host Range and an Optimized ACE2 for SARS-CoV-2 Infection*, 526 BIOCHEMICAL & BIOPHYSICAL RSCH. COMMC'N 165, 166 (2020).
[82] Angela M. Bosco-Lauth et al., *Survey of Peridomestic Mammal Susceptibility to SARS-CoV-2 Infection*, BIORXIV, Jan. 2021, at 2.
[83] Markus Hoffman et al., *SARS-CoV-2 Mutations Acquired in Mink Reduce Antibody-Mediated Neutralization*, CELL REPORTS, Apr. 2021, at 5.
[84] Angela M. Bosco-Lauth et al., *Survey of Peridomestic Mammal Susceptibility to SARS-CoV-2 Infection*, BIORXIV, Jan. 2021, at 2.
[85] Junwen Luan et al., *Spike Protein Recognition of Mammalian ACE2 Predicts the Host Range and an Optimized ACE2 for SARS-CoV-2 Infection*, 526 BIOCHEMICAL & BIOPHYSICAL RSCH. COMMC'N 165, 166 (2020).
[86] *Id.*
[87] Ilya R. Fischoff et al., *Predicting the zoonotic capacity of mammals to transmit SARS-CoV-2*, 288 PROC. ROYAL SOC'Y B 1, 6 (2021).
[88] *Id.* at Supplementary Figure 6.
[89] *Id.*
[90] Angela M. Bosco-Lauth et al., *Survey of Peridomestic Mammal Susceptibility to SARS-CoV-2 Infection*, BIORXIV, Jan. 2021, at 2.; Anna Fagre et al., *SARS-CoV-2 Infection, Neuropathogenesis and Transmission Among Deer Mice: Implications for Spillback to New World Rodents*, PLOS PATHOGENS, May 2021, at 1; Anna Michelitsch et al., *SARS-CoV-2 in animals: From potential hosts to animal models*, 110 ADVANCES IN VIRUS RSCH. 59 (2021).
[91] Anna Fagre et al., *SARS-CoV-2 Infection, Neuropathogenesis and Transmission Among Deer Mice: Implications for Spillback to New World Rodents*, PLOS PATHOGENS, May 2021, at 2.
[92] *Id.*
[93] Bryan D. Griffin et al., *SARS-CoV-2 Infection and Transmission in the North American Deer Mouse*, NATURE COMMC'NS, June 2021, at 1; Jasper Fuk-Woo Chan et al., *Simulation of the Clinical and Pathological Manifestations of Coronavirus Disease 2019 (COVID-19) in a Golden Syrian Hamster Model: Implications for Disease Pathogenesis and Transmissibility*, 71 CLINICAL INFECTIOUS DISEASES 2428, 2428 (2020); Sin Fun Sia et al., *Pathogenesis and Transmission of SARS-CoV-2 in Golden Hamsters*, 583 NATURE 834, 834 (2020).

people: "Deer mice (*P. maniculatus*) are the most studied and abundant mammals in North America and are frequently contacted by mammalogists during field studies."[94]

While experimentally infected deer mice appear asymptomatic or experience only mild disease, "[t]he extent to which these observations may translate to wild deer mouse populations remains unclear."[95] That is, deer mice in the wild could experience more or less severe forms of the disease.[96] If it is more severe, it could have a greater impact on deer mouse populations; if it is relatively mild, it could make infected populations more difficult to detect and monitor. In either case, Griffin et al. (2021) warned that there is a real risk that deer mice or other *Peromyscus* mice could become reservoirs of SARS-CoV-2, as they have for several other diseases: "The findings reported here are concerning in light of the fact that *Peromyscus* species rodents tolerate persistent infection with and serve as the primary reservoirs for several emerging zoonotic pathogens that spillover into humans, including *Borrelia burgdorferi* [the causative agent of Lyme disease], DTV [deer tick virus], and SNV [Sin Nombre orthohantavirus]."[97] Indeed, there is evidence that the SARS-CoV-2 Omicron variant originated in mice.[98]

The susceptibility of white-tailed deer is also alarming. There are an estimated 30 million white-tailed deer in the United States,[99] many of which inhabit human-populated areas. They are at particularly high risk of becoming infected with, and potentially transmitting, SARS-CoV-2 because they "are permissive to infection, exhibit sustained viral shedding, can transmit to conspecifics, exhibit social behavior, and can be abundant near urban centers."[100] In 2021, researchers collected samples from 385 deer in Illinois, Michigan, New York and Pennsylvania; 40 percent tested positive for SARS-CoV-2 antibodies, indicating past exposure to the virus.[101] Another study conducted in northeastern Ohio that year detected SARS-CoV-2 in about one-third of 360 sampled free-ranging white-tailed deer.[102] Around the same time, a study conducted in Iowa similarly found that about one-third of 283 samples collected from free-ranging and captive white-tailed deer in the state tested positive for SARS-CoV-2 infection.[103]

---

[94] Anna Fagre et al., *SARS-CoV-2 Infection, Neuropathogenesis and Transmission Among Deer Mice: Implications for Spillback to New World Rodents*, PLOS PATHOGENS, May 2021, at 2, 7.
[95] Bryan D. Griffin et al., *SARS-CoV-2 Infection and Transmission in the North American Deer Mouse*, NATURE COMMC'NS, June 2021, at 1.
[96] Analogously, the USFWS determined that salamander species could experience more severe disease in the wild than under experimental conditions. *See* 81 Fed. Reg. 1534, 1535 (Jan. 13, 2016) ("Native salamander species that demonstrate limited disease under experimental conditions may demonstrate more severe clinical disease when infection is combined with additional stressors in the wild.").
[97] Bryan D. Griffin et al., *SARS-CoV-2 Infection and Transmission in the North American Deer Mouse*, NATURE COMMC'NS, June 2021, at 6.
[98] Changshuo Wei et al., *Evidence for a mouse origin of the SARS-CoV-2 Omicron variant*, 48 J. of GENETICS AND GENOMICS 1111 (Dec. 24, 2021).
[99] *White-tailed Deer* (Odocoileus virginianus), NEW HAMPSHIRE FISH AND GAME DEPT., https://www.wildlife.state.nh.us/wildlife/profiles/deer.html (last visited July 15, 2022).
[100] Jeffrey C. Chandler et al., *SARS-CoV-2 exposure in wild white-tailed deer (Odocoileus virginianus)*, 118 Proceedings of the National Academy of Sciences 47, 1 (Oct. 18, 2021).
[101] Jeffrey C. Chandler et al., *SARS-CoV-2 exposure in wild white-tailed deer (Odocoileus virginianus)*, 118 Proceedings of the National Academy of Sciences 47 (Oct. 18, 2021).
[102] Vanessa L. Hale et al., *SARS-CoV-2 infection in free-ranging white-tailed deer*, 602 NATURE 481 (Feb. 17, 2022).
[103] Suresh V. Kuchipudi et al., *Multiple spillovers from humans and onward transmission of SARS-CoV-2 in white-tailed deer*, 119 PROC. OF THE NAT'L ACAD. OF SCI. 1 (2022).

Such widespread infection is troubling both because it suggests that white-tailed deer have become a new reservoir for the disease, and because infected deer could transmit the virus to each other, other wildlife, and humans. Indeed, earlier this year, Canadian researchers studying white-tailed deer in Ontario identified the first known instance of deer-to-human transmission of the virus.[104] Further, the study raised the possibility that some of the white-tailed deer had become infected by mink: genetic analysis indicated that the viral strain affecting the deer in Ontario shared specific mutations with the strain that had infected farmed mink in nearby Michigan.[105]

In addition to white-tailed deer, there is also a serious risk of reservoir establishment in carnivore species such as mink. This is because carnivorous mammals are "immunologically challenged,"[106] in that they "have either missing or mutated immune genes that make them less able to identify and fend off pathogens."[107] This lack of functioning genes can enable pathogens to hide and spread undetected (i.e., the host animals appear asymptomatic), which in turn increases the risk of carnivores becoming new reservoirs for disease. Indeed, researchers have found that approximately 49 percent of carnivore species—"the highest proportion of any mammal order including bats,"—harbor one or more unique zoonotic pathogens.[108]

The risk of reservoir establishment is especially high in environments such as industrial mink farms, where the crowded conditions facilitate viral transmission.[109] Indeed, while thousands of farmed mink have become visibly sick and died from the virus, many others appear to have experienced asymptomatic infections. As mentioned above, after testing farmed mink in Denmark, Hammer et al. (2021) reported that many infections occurred without symptoms or mortality.[110]

The potential for mink or other species to become permanent reservoirs for the virus is a major concern for several reasons. First, it could cause ongoing illness and death within the infected animal population itself. Second, the virus could evolve and mutate into variants that are more transmissible or dangerous to humans. For example, Munnink et al. (2020) estimated that the

---

[104] Bradley Pickering et al., *Highly divergent white-tailed deer SARS-CoV-2 with potential deer-to-human transmission*, 2022 BIORXIV 1, 2.
[105] *Id.* at 9.
[106] Zsofia Digby, *Evolutionary loss of inflammasomes in the Carnivora and implications for the carriage of zoonotic infections*, CELL REPORTS, Aug. 2021, at 3.
[107] Annie Lennon, *Farming carnivores may encourage 'disease reservoirs'*, MED. NEWS TODAY (Aug. 27, 2021), https://www.medicalnewstoday.com/articles/farming-carnivores-may-encourage-disease-reservoirs.
[108] Zsofia Digby, *Evolutionary loss of inflammasomes in the Carnivora and implications for the carriage of zoonotic infections*, CELL REPORTS, Aug. 2021, at 1; Barbara Han et al., *Global patterns of zoonotic disease in mammals*, 32 TRENDS IN PARASITOLOGY 7, July 2016, at 571.
[109] Jonathan Anomaly, *What's Wrong with Factory Farming*?, 8 PUB. HEALTH ETHICS 246 (2015); Jeanette I. Webster Marketon, *Stress hormones and immune function*, 252 CELLULAR IMMUNOLOGY 16 (2008).
[110] Anne Sofie Hammer et al., *SARS-CoV-2 Transmission between Mink (*Neovison vison*) and Humans, Denmark*, 27 EMERGING INFECTIOUS DISEASES 547 (2021); *see also* M. Pomorska-Mól et al., *Review: SARS-CoV-2 Infection in Farmed Minks – an Overview of Current Knowledge on Occurrence, Disease and Epidemiology*, ANIMAL, June 2021, at 1.

virus mutates approximately once every two weeks in farmed mink populations.[111] These mutations can result in variants that are more harmful and less susceptible to vaccines than the original strain. As Banerjee et al. (2021) warn, “The presence of additional SARS-CoV-2 variants with the ability to reinfect vaccinated or immune populations has the potential for devastating consequences for human health.”[112]

Most concerning may be mutations that occur within the virus’s spike proteins—the protrusions on the surface of the virus particle that help the virus attach to and enter host cells. Changes in the spike protein are particularly important because such mutations could create “virus populations that would no longer be susceptible to neutralization by antibodies present in vaccinated or naturally infected individuals.”[113] Fenollar et al. (2021) reported that, as of early 2021, about 170 mutations had been identified in mink SARS-CoV-2 samples from 40 mink farms, “and mink-specific mutations of SARS-CoV-2 (including a . . . mutation in the viral spike) have been found in humans.”[114]

Third, if it infects animals that already host other coronaviruses, such as many bat species, the SARS-CoV-2 virus could “recombine” with those coronaviruses. That is, the viruses could “interact during replication to generate virus progeny that have some genes from both parents.”[115] The process of recombination “can lead to the selection or generation of strains capable of switching hosts, posing a threat to human and animal health.”[116] Indeed, as Banerjee et al. (2021) noted, “[t]he presence of bats or bat colonies on farms that house SARS-CoV-2-susceptible animals, such as minks . . . should be assessed and a contingency plan developed to restrict contact.”[117] This is because “[t]he highly mobile nature and diversity of bats combined with their ability to host viruses in the absence of clinical disease makes them a particular concern for virus persistence and ongoing transmission to other susceptible hosts.”[118]

When the virus spreads to other species, it “is likely to acquire adaptive mutations that ensure efficient viral spread in these species.”[119] Once the virus has spread widely within a population, and the species has become a new reservoir, it becomes very hard to control it. In a television interview, disease ecologist Barbara Han said she could not name a disease humans have been able to eradicate once it has reached that point.[120] It is also difficult to predict how the virus would evolve within a host population, or whether it would re-emerge and infect humans or other

[111] Bas B. Oude Munnink et al., *Jumping Back and Forth: Anthropozoonotic and Zoonotic Transmission of SARS-CoV-2 on Mink Farms*, BIORXIV, Sept. 2020, at 21.
[112] Arinjay Banerjee et al., *Zooanthroponotic Potential of SARS-CoV-2 and Implications of Reintroduction into Human Populations*, 29 CELL HOST & MICROBE 160, 163 (2021).
[113] *Id.*
[114] Florence Fenollar et al., *Mink, SARS-CoV-2, and the Human-Animal Interference*, FRONTIERS IN MICROBIOLOGY, Apr. 2021, at 8.
[115] W. Robert Fleischmann, Jr., *Viral Genetics, in* MEDICAL MICROBIOLOGY (Baron S. ed., 4th ed. 1996).
[116] Arinjay Banerjee et al., *Zooanthroponotic Potential of SARS-CoV-2 and Implications of Reintroduction into Human Populations*, 29 CELL HOST & MICROBE 160, 162 (2021).
[117] *Id.* at 163.
[118] *Id.*
[119] Markus Hoffman et al., *SARS-CoV-2 Mutations Acquired in Mink Reduce Antibody-Mediated Neutralization*, CELL REPORTS, Apr. 2021, at 5.
[120] Alissa Greenberg, *What’s the Deal with Mink Covid?*, PBS NOVA (Mar. 5, 2021), https://www.pbs.org/wgbh/nova/article/mink-covid-virus-mutation/.

species, even those who have been previously exposed to SARS-CoV-2 or vaccinated. But that is a distinct risk. By comparison, at least six actively managed livestock diseases in the United States currently "have a wildlife reservoir that is a recognized impediment to eradication due to continued spillover to domestic populations."[121] Indeed, "the risk of reservoir establishment with unforeseeable consequences [was] the basis for the decisions to cull [millions of mink on] farms in the Netherlands and Denmark."[122] Similarly, British Columbia recently announced it would phase out its mink industry, in part due to "concerns the animals would act as a reservoir for the SARS-CoV-2 virus to mutate."[123]

Further, infected animals, like many humans, may be asymptomatic.[124] In other words, they may experience "subclinical" infections with no signs or symptoms of disease. That could make it more difficult to determine whether a species could serve as—or has already become—a permanent reservoir for the virus.[125] As Pomorska et al. (2021) explain, "[I]n minks, clinical and subclinical forms of infection with SARS-CoV-2 can occur, making it potentially problematic to detect. Therefore, mink farms could represent a possibly dangerous, not always recognized, animal reservoir for SARS-CoV-2."[126] The same could be true for other animal populations.

Importantly, variants that develop and emerge in other species can be transmitted not only from infected animals to humans, but also from infected humans to other humans. For example, in 2020, researchers in Denmark observed the emergence of a mink variant that spread first to humans connected to mink farms and then to the community more broadly.[127] Between June and November of that year, the researchers estimated that 27 percent of the 5,159 confirmed human COVID-19 cases in northern Denmark were caused by mink variant strains, and that "at the peak of the epidemic more than half of the strains sequenced from human samples . . . were mink-associated."[128] While the study authors acknowledged that "[t]he Danish experiences are unique because of the magnitude of the Danish mink production," they nonetheless cautioned that "other countries with farmed mink may well experience similar risks."[129] The same risks apply to countries, including the United States, where mice, deer, or other susceptible species could become infected and transmit the virus to humans.

---

[121] Ryan S. Miller et al., *Diseases at the livestock–wildlife interface: status, challenges, and opportunities in the United States*, 110 PREVENTIVE VETERINARY MED. 119 (2013).
[122] Marion Koopmans, *SARS-CoV-2 and the Human-Animal Interface: Outbreaks on Mink Farms*, 21 LANCET 18, 19 (2021).
[123] Stefan Labbé, *B.C. to ban mink farms, citing concerns of new COVID-19 variants*, Times Colonist (Nov. 5, 2021), https://www.timescolonist.com/bc-news/bc-to-ban-mink-farms-citing-concerns-of-new-covid-19-variants-4729636.
[124] Florence Fenollar et al., *Mink, SARS-CoV-2, and the Human-Animal Interference*, FRONTIERS IN MICROBIOLOGY, Apr. 2021, at 5.
[125] Khan Sharun et al., *SARS-CoV-2 in Animals: Potential for Unknown Reservoir Hosts and Public Health Implications*, 41 VETERINARY QUARTERLY 181, 181 (2021).
[126] M. Pomorska-Mól et al., *Review: SARS-CoV-2 Infection in Farmed Minks – an Overview of Current Knowledge on Occurrence, Disease and Epidemiology*, ANIMAL, June 2021, at 7.
[127] Helle Daugaard Larsen et al., *Preliminary Report of an Outbreak of SARS-CoV-2 in Mink and Mink Farmers Associated with Community Spread, Denmark, June to November 2020*, RAPID COMMC'N, Feb. 2021, at 1.
[128] *Id.* at 5.
[129] *Id.*

C. Manure

In addition to the mink themselves, waste materials produced on mink farms could serve as vectors for the virus. For example, SARS-CoV-2 can be found in infected mink feces.[130] In an interview with Wisconsin Public Radio, Wisconsin state veterinarian Dr. Darlene Konkle acknowledged that "manure and other properties . . . could potentially be a source of the virus."[131] Feces produced by farmed mink typically fall through the wire floors of their cages to the ground below, where they pile up unless or until they are eventually removed and disposed of. Some mink operations dispose of the manure by composting or stockpiling it.[132] If rodents or other wildlife access infected manure while it is in raw piles, or while it is being composted or stored, they could become infected. This would especially be the case if the manure is not composted properly or stored securely.

Some operations apply manure to fertilize farm lands.[133] For example, earlier this year a mink farm in Oregon was authorized to spread manure that had been infected with the virus on the land surrounding the farm.[134] The Oregon farm first composted the manure "per USDA guidance;"[135] however, it is not clear if it was tested for presence of the virus afterward. Nor is it known whether other farms that spread manure on their land first compost it, compost it correctly, or test it afterward. Fur Commission operating guidelines encourage mink farm operators to "consider composting disease-contaminated manure until safe" because "[t]he spreading of contaminated manure can infect wildlife and greatly increase you [sic] and your neighbor's chances of exposure."[136] Once again, however, those guidelines are not binding; nor do they provide specific instructions on how to correctly compost.

---

[130] Hai Nguyen Tran et al., *SARS-CoV-2 Coronavirus in Water and Wastewater: A Critical Review About Presence and Concern*, ENV'T RSCH., Oct. 2020; Kuldeep Dhama et al., *SARS-CoV-2 Existence in Sewage and Wastewater: A Global Public Health Concern?*, J. ENV'T MGMT., Dec. 2020; Anette Boklund et al., *Monitoring of SARS-CoV-2 Infection in Mustelids*, EFSA J., Jan. 2021, at 18; World Health Org., *SARS-CoV-2 in Animals Used for Fur Farming: GLEWS+ Risk Assessment*, at 4, WHO Doc. 2019-nCoV/fur_farming/risk_assessment/2021.1 (Jan. 20, 2021), https://www.who.int/publications/i/item/WHO-2019-nCoV-fur-farming-risk-assessment-2021.1.

[131] Hope Kirwan, *Wisconsin Farms Working To Vaccinate Mink Against Coronavirus*, WIS. PUB. RADIO (July 8, 2021), https://www.wpr.org/wisconsin-farms-working-vaccinate-mink-against-coronavirus.

[132] FUR COMM'N USA, STANDARD GUIDELINES FOR THE OPERATION OF MINK FARMS IN THE UNITED STATES BOOK 4: RECORDS AND PROTOCOLS 55 (2019).

[133] *Pollution Prevention, Water Quality & Mink Farming*, FUR COMM'N USA, https://furcommission.com/pollution-prevention-water-quality-mink-farming/; see also Michael Lee, *Mink farming and SARS-CoV-2: staying vigilant at the human-animal interface*, National Collaborating Centre for Environmental Health (Jan. 18, 2021), https://ncceh.ca/content/blog/mink-farming-and-sars-cov-2-staying-vigilant-human-animal-interface.

[134] E-mail from Ryan P. Scholz, State Veterinarian, Oregon Department of Agriculture – Animal Health Program to Emilio DeBess, State Public Health Veterinarian, Acute and Communicable Disease Program, Oregon State Public Health and Colin Gillin, State Wildlife Veterinarian, Wildlife Health and Population Lab, Oregon Department of Fish and Wildlife (Feb. 8, 2021, 11:11 PST).

[135] *Id.*

[136] JOHN S. EASLEY D.M.V., FUR COMM'N USA, STANDARD GUIDELINES FOR THE OPERATION OF MINK FARMS IN THE UNITED STATES BOOK 3: BIOSECURITY PROTOCOLS FOR MINK FARMS IN THE UNITED STATES 4 (2019).

D. Wastewater and Surface Water Runoff

Another means by which mink farms could spread the virus into the environment is through the discharge of contaminated wastewater or surface water runoff. Indeed, the Fur Commission guidelines describe "[e]xposure to pathogens via . . . water" as "common."[137] For example, they explain that "[a] major concern with [re-circulating water systems] is that they can become contaminated and expose all the mink to disease."[138]

SARS-CoV-2 can shed from feces into water,[139] and once in water, it may remain infectious for many days, depending on factors such as the temperature of the water and the concentration of suspended solids.[140] Mink farms may have liquid waste management systems involving manure storage facilities that could overflow.[141] There is also a risk of "[d]irect runoff from feedlots/mink pen areas or stored manure" into nearby waters.[142] Some farm operators may discharge waste directly into streams. For instance, in 2013, the owner of two mink farms in northwestern Washington was fined $48,000 by the Washington Department of Ecology for discharging water contaminated with manure into nearby creeks.[143]

These possibilities are made more concerning by the research of Aguilo-Gisbert et al. (2021). They reported that 2 out of 13 wild mink captured in Spain tested positive for SARS-CoV-2.[144] They concluded it was unlikely that the mink became infected through contact with other infected mink—escaped or wild—for several reasons: The nearest mink farms were several miles away, had "approved anti-escape measures," had not reported any positive cases of SARS-CoV-2, had not reported any escapes during the COVID-19 pandemic, and had mostly white-furred animals (the captured mink were brown). In addition, the two positive animals lived in different river valleys separated by a mountain range, suggesting the mink populations in both valleys were not in frequent contact, and none of the other mink captured in the two populations tested positive. Instead, the study authors theorized that the two positive mink became infected through contact with contaminated wastewaters:

---

[137] *Id.*

[138] *Id.*

[139] Jordi Aguilo-Gisbert et al., *First Description of SARS-CoV-2 Infection in Two Feral American Mink (Neovison vison) Caught in the Wild*, ANIMALS, May 2021, at 9; Hai Nguyen Tran et al., *SARS-CoV-2 Coronavirus in Water and Wastewater: A Critical Review About Presence and Concern*, ENV'T RSCH., Oct. 2020, at 1; Kuldeep Dhama et al., *SARS-CoV-2 Existence in Sewage and Wastewater: A Global Public Health Concern?*, J. ENV'T MGMT, Dec. 2020, at 1; Kay Bernard et al., *Detection of SARS-CoV-2 in urban stormwater: An environmental reservoir and potential interface between human and animal sources*, 807 SCI. OF THE TOTAL ENV'T. 1, 2 (2022).

[140] Hai Nguyen Tran et al., *SARS-CoV-2 Coronavirus in Water and Wastewater: A Critical Review About Presence and Concern*, ENV'T RSCH., Oct. 2020, at 1.

[141] *Pollution Prevention, Water Quality & Mink Farming*, FUR COMM'N USA, https://furcommission.com/pollution-prevention-water-quality-mink-farming/.

[142] *Id.*

[143] *WA mink farm fined for manure discharge*, MANURE MANAGER (Apr. 2, 2013), https://www.manuremanager.com/wa-mink-farm-fined-for-manure-discharge-13209/.

[144] Jordi Aguilo-Gisbert et al., *First Description of SARS-CoV-2 Infection in Two Feral American Mink (Neovison vison) Caught in the Wild*, ANIMALS, May 2021, at 1.

> As American mink very much depend on aquatic environments, a conceivable possibility for explaining the infection with SARS-CoV-2 of our two animals would be that these animals were the subject of sporadic infection by virus present in wastewaters. SARS-CoV-2 is found in the feces of infected humans and is shed into wastewaters. . . . Inappropriate management or leaks from sewage facilities can lead to wastewater being released to surface water bodies, which would convert this type of event into a potential source of infection. . . . The possibility of intermittent spill outs and of contagion at untreated sewage discharge points rather than in the open river waters, where the virus would be much diluted, together with local and temporal changes in the viral levels in wastewaters, could explain why only 2 of the 13 mink were infected.[145]

In a follow-up study, in a different area of Spain, the same researchers detected the presence of SARS-CoV-2 in a river otter.[146] The researchers cautioned that, due to their findings and previous reports of SARS-CoV-2 in captive Asian small-clawed otters, all otter species may be susceptible to the virus.[147] Further, the authors speculated that infection via water transmission could have likewise occurred in the case of otters in the area, "which are also aquatic animals, particularly since the [nearby] Bellús reservoir is of low microbiological quality, with recorded episodes of urban wastewater discharge into it via the Albaidea river that have been reprimanded by the European Commission."[148]

In the same way, contaminated wastewaters or surface runoff waters originating from infected mink farms could enter nearby waterbodies and put wild species living in or around those waters at risk.

E. Mink Carcasses

Yet another form of waste generated each year by mink farms are the hundreds or thousands of carcasses from animals that are killed for their fur or that die of disease or injury. According to world health authorities, "transmission of SARS-CoV-2 from fur farmed animals to wildlife is possible through direct contact between wildlife and infected farmed animals, as well as through indirect contact with contaminated carcasses."[149] Similarly, the Fur Commission warns that carcasses are "potentially highly contaminated [with pathogens] and infectious to other mink and people."[150] Carcasses must be "handled correctly" because operators "have a duty to protect your

---

[145] *Id.* at 9-10.
[146] Miguel Padilla-Blanco, *The Finding of the Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2) in a Wild Eurasian River Otter (Lutra lutra) Highlights the Need for Viral Surveillance in Wild Mustelids*, 9 Frontiers in Veterinary Sci. 1 (2022).
[147] *Id.* at 5.
[148] *Id.* at 6.
[149] Food and Agriculture Organization of the United Nations, World Organization for Animal Health, and World Health Organization, SARS-CoV-2 in animals used for fur farming: GLEWS+ Risk assessment, 4 (Jan. 20, 2021).
[150] John S. Easley D.M.V., FUR COMM'N USA, STANDARD GUIDELINES FOR THE OPERATION OF MINK FARMS IN THE UNITED STATES BOOK 3: BIOSECURITY PROTOCOLS FOR MINK FARMS IN THE UNITED STATES 5 (2019).

neighbors and keep any diseases from being introduced into the wildlife."[151] Yet, incongruously, the Fur Commission acknowledges that carcasses are often widely distributed in ways that could facilitate the spread of disease:

> Some farmers trade [mink carcasses] for fish offal with fishermen who use them as crab bait. . . . Other farmers give the carcasses to people who raise birds of prey or run wildlife preserves, zoos or aquariums. Yet others use them to make organic compost. Or they may be bought and rendered down to provide raw materials for a wide range of products, from tires and paint to makeup and organic fertilizers.[152]

For carcasses that are not sold or given away, Fur Commission guidelines encourage operators to store carcasses in "5-gallon plastic pails with lids" until they can be burned, composted, or buried.[153] It is not clear how secure carcasses are from wildlife if they are dumped in compost piles or buried in the ground, much less if they are stored in plastic buckets. Nor is it clear how many operators adhere to Fur Commission guidelines.

As with manure, if wildlife or other animals on the farm (such as cats or mice) access infected carcasses or waste fur (attached or unattached to the carcasses), they could become infected. Also similar to manure, this is especially the case if carcasses are not composted or disposed of properly. For instance, according to Utah state veterinarian Dr. David Taylor, "Hot composting can kill pathogens, but it has to be done right. . . . After we went onto these [mink] farms and saw what they considered to be composting, which really were just piled-up mink, we made the decision here in Utah to just have these [carcasses] buried at landfills."[154] It is not clear whether, or to what extent, landfills are more secure than mink farms from scavenging wildlife.

In an analogous context, Nituch et al. (2011) warned that "improper disposal of pelted mink carcasses, dead-stock, manure and other waste" on mink farms in Canada were potential contributing factors to the spread of Aleutian disease, a highly pathogenic parvovirus affecting mink and other mustelids.[155] Similarly, Bowman et al. (2014) suggested that the "major point of spillover of [the Aleutian disease virus] between mink farms [in Canada] and wildlife is manure and composting carcasses on mink farms," because wildlife sometimes visit manure or carcass compost piles.[156]

---

[151] *Id.*

[152] *Frequently Asked Questions*, Fur Comm'n USA, https://furcommission.com/faq/#:~:text=Mink%20carcasses%20are%20rarely%20eaten,meat%2C%20but%20seals%20hate%20it.

[153] JOHN S. EASLEY D.M.V., FUR COMM'N USA, STANDARD GUIDELINES FOR THE OPERATION OF MINK FARMS IN THE UNITED STATES BOOK 3: BIOSECURITY PROTOCOLS FOR MINK FARMS IN THE UNITED STATES 5 (2019).

[154] Kate Golden, *The Wild World of Mink and Coronavirus*, SIERRA (Jan. 7, 2021), https://www.sierraclub.org/sierra/wild-world-mink-and-coronavirus.

[155] Larissa A. Nituch et al., *Mink Farms Predict Aleutian Disease Exposure in Wild American Mink*, PLoS ONE, July 2011, at 2.

[156] Jeff Bowman et al., *Testing for Aleutian Mink Disease Virus in the River Otter (Lontra canadensis) in Sympatry with Infected American Mink (Neovison vison)*, 50 J. WILDLIFE DISEASES 689, 689 (2014).

F. Mink Fur

Another potential vector of the virus is mink fur. Boklund et al. (2021) tested multiple samples of fur that had been removed from mink on two different mink farms in Denmark for the presence of SARS-CoV-2; all were positive.[157] Further, Virtanen et al. (2021) found that, while the virus only remained viable for up to a few days on most surfaces, it remained infectious for 10 days or more on mink fur.[158] In fact, SARS-CoV-2 survived so much longer on mink pelts than other surfaces that the study authors raised the possibility that "this stability contributes to the efficient spread of the virus within mink farms."[159] It was not clear to the researchers whether the virus's longevity on mink fur was due to the fur's mechanical or biological properties, or both—though it appeared that, for example, the fur's mechanical properties protected the virus from UV treatment.[160]

This suggests that infected mink fur—whether on live animals, carcasses, pelts, or finished products, and whether in fur farms, compost piles, landfills, or commercial trade—could contribute to the infection of humans and wildlife. Indeed, with respect to trade, the World Organisation for Animal Health ("OIE") has cautioned that "there is insufficient evidence to consider raw mink furskins as safe for international trade, and further research is needed to better understand any risk to human or animal health potentially posed by international trade in contaminated pelts or fur."[161] Citing research conducted by Riddel et al. (2020),[162] the European Centre for Disease Prevention and Control stated that "it is probable that SARS-CoV-2 on the pelt of live mink can remain viable for 1-2 weeks."[163] The agency also warned that partially processed furs may not be safe and that trade in raw pelts should be banned:

> When mink are pelted, the drying process and the storage period will reduce the virus load on pelts, although this may not completely inactivate the virus, which may remain viable on the raw pelts transported to other areas for further processing. Additional contamination of raw pelts by an infected person cannot be excluded. . . . National authorities should consider . . . destroying raw pelts in accordance with appropriate biosecurity measures. A ban on the movement of live mink and raw pelts processed in 2020 within the EU and worldwide should also be considered for as long as SARS-CoV-2 exposure from humans to mink is occurring.[164]

While the chemical tanning or dressing process may inactivate the virus on mink fur, an infected person could re-contaminate the pelt or fur on a finished product through physical handling or respiratory droplets. This could put consumers and others who handle even fully processed mink

---

[157] Anette Boklund et al., *SARS-CoV-2 in Danish Mink Farms: Course of the Epidemic and a Descriptive Analysis of the Outbreaks in 2020*, 11 ANIMALS 164 (2021).
[158] Jenni Virtanen et al., *Survival of SARS-CoV-2 on Clothing Materials,* ADVANCES IN VIROLOGY, Apr. 2021, at 1.
[159] *Id.* at 4.
[160] *Id.*
[161] OIE, GUIDANCE ON WORKING WITH FARMED ANIMALS OF SPECIES SUSCEPTIBLE TO INFECTION WITH SARS-COV-2 5 (2021).
[162] Shane Riddell et al., *The effect of temperature on persistence of SARS-CoV-2 on common surfaces*, 17 VIROLOGY J. (2020).
[163] ECDPC, DETECTION OF NEW SARS-COV-2 VARIANTS RELATED TO MINK 9 (2020).
[164] *Id.* at 9, 12.

furs or fur products at risk. In an analogous context, Han and Liu (2021) determined that imported cold food is a major cause for the recurrence and spread of COVID-19 in China.[165] They found that the virus can survive nearly three weeks on cold food and food packaging materials and that, during long-distance shipping, such materials are likely to become contaminated by infected workers, posing a threat to others further down the supply chain:

> Overall we found that SARS-CoV-2 virus can survive 20 days through cold chain transportation with low temperature, and the contaminated cold food or food packaging material can transmit the SARS-CoV-2 virus along the cold chain logistics through "person-to-thing-to-person" transmission not just through "person-to-person."[166]

In the same way, "person-to-thing-to-person" transmission and infection of the virus could occur along the mink pelt and mink fur product supply chains.

Evidence indicates that the SARS-CoV-2 virus can survive for unusually long periods of time on mink fur, that raw and even partially processed mink pelts pose a significant threat to human health, and that even fully processed mink pelts or other products containing mink fur could become contaminated if they are handled by infected individuals while in transit, putting consumers and others who interact with those products at risk.

III. APHIS's Strategic Plan Should Propose to Prohibit the Import and Interstate Movement of Mink and Products Containing Mink Fur

Finally, as a tactic to achieving its disease-related goals and objectives,[167] APHIS's strategic plan should propose to prohibit or restrict the import and interstate movement of live mink and materials containing mink fur. As discussed above, farmed mink have proven particularly susceptible to the SARS-CoV-2 virus and are capable of transmitting it to humans, each other, and other animals through a wide variety of pathways. The virus has already infected multiple mink herds in the United States and Canada, and hundreds more in Europe; it could easily spread to additional farms and mutate, putting humans, captive and wild mink, and other species at risk. Thus, it is critical that APHIS take meaningful action to prevent further infection and transmission.

One way to prevent the virus from spreading would be for APHIS to exercise its authority under the AHPA, 7 U.S.C. §§ 8301-8322, to prohibit or restrict the importation and interstate transportation of mink and mink parts containing fur. Doing so would ensure that mink infected with SARS-CoV-2 do not enter the United States or travel between states, either of which could increase the risk of transmission between mink, other animals, and humans.

[165] Shilian Han and Xinwang Liu, *Can imported cold food cause COVID-19 recurrent outbreaks? A review*, ENV'T CHEMISTRY LETTERS, Sept. 2021.
[166] *Id.* at 5.
[167] *See* Framework 3-5, Goals 2-5.

A. The Animal Health Protection Act

The AHPA authorizes the Secretary of Agriculture to impose certain prohibitions or restrictions for "the prevention, detection, control, and eradication of diseases and pests of animals." 7 U.S.C. § 8301(1); *see also In re: Ronald Walker, Alidra Walker, and Top Rail Ranch, Inc.*, No. 07-0131, 2010 WL 10079153, at *41. The Act was designed, in part, to protect the health of animals, humans, and the environment. *See* 7 U.S.C. § 8301(1); *see also In re: Ronald Walker,* at *41.[168] In furtherance of this goal, the Act authorizes APHIS[169] to prohibit or restrict the importation and movement in interstate commerce of, among other things, any "animal" or "article" if doing so is necessary to prevent the introduction or spread of any "pest or disease of livestock." 7 U.S.C. §§ 8303, 8505; *see also Ranchers Cattlemen Action Legal Fund United Stockgrowers of America v. U.S. Dept. of Agriculture*, 499 F.3d 1108, 1115 (9th Cir. 2007).

The Act defines "animal" as any non-human member of the animal kingdom. 7 U.S.C. § 8302(1). It defines "article" as "any pest or disease or any material or tangible object that could harbor a pest or disease." *Id.* § 8302(2). The term "pest" includes viruses "that can directly or indirectly injure, cause damage to, or cause disease in livestock." *Id.* § 8302(13). As mentioned above, the term "livestock" means "all farm-raised animals." 7 U.S.C. § 8302(10); *see also* 9 C.F.R. § 71.1. The Act's definition of livestock does "not place any conditions or restrictions on the method by which the animal has been produced."[170]

To date, the term "disease" remains undefined.[171] *See* 7 U.S.C. § 8302(3). Congress left the regulatory definition of "disease" to the discretion of APHIS so that it would "have maximum flexibility to focus its resources and respond to new or emerging disease threats."[172] Accordingly, APHIS has promulgated regulations to prevent numerous "diseases of livestock," including tuberculosis, chronic wasting disease, and avian influenza. *See* 9 C.F.R. Subch. B, Parts 51, 55, 56.

B. Authority, precedent, and need for action

APHIS has and should exercise its authority under the Act to prohibit or restrict the importation and interstate movement of mink and materials containing mink fur. First, APHIS has authority to take such action. Mink are non-human animals. *See* 7 U.S.C. §8302(1). Captive mink are

---

[168] Farm Security and Rural Investment Act of 2002, Pub. L. No. 107-171, § 10402, 116 Stat. 134, 494 (to be codified at 7 U.S.C. § 8301) (recognizing control of diseases and pests of animals is essential to protect the health of animals and the people of the United States); H.R. REP. NO. 107-424, at 664 (2002) ("[T]he principal purpose of the Animal Health Protection Act is to protect against animal disease."); *World Heritage Animal Genomic Res. v. Stull*, No. 5: 20-334-DCR, slip op. at 1 (E.D. Ky. Aug. 14, 2020) (The Act "is concerned with the interstate movement of animals that pose a danger to public health.").

[169] The Secretary of Agriculture has delegated its authority to carry out the AHPA to the Under Secretary for Marketing and Regulatory Programs. *See* 7 C.F.R. § 2.22(a)(2)(xxxii). The Under Secretary has, in turn, delegated its authority to APHIS. *See* 7 C.F.R. § 2.80(a)(37); *see also Humane Society of the United States v. U.S. Dept. of Agriculture*, No. 20-03258, 2021 WL 1593243, at *2.

[170] Regulation of the Movement of Animals Modified or Developed by Genetic Engineering, 85 Fed. Reg. 84,269, 84,269 (Dec. 28, 2020) (to be codified at 9 C.F.R. pt. 1, 3).

[171] *Id.*

[172] H.R. REP. NO. 107-424, at 664 (2002).

livestock because they are raised on farms. *See* 7 U.S.C. § 8302(10). Materials containing mink fur are “tangible objects that could harbor a pest or disease.” 7 U.S.C. § 8302(2). Indeed, as discussed above, the SARS-CoV-2 virus appears to survive and remain infectious on mink fur much longer than most other surfaces. SARS-CoV-2 is a “pest” because it is a virus that injures, causes damage to, and causes disease in captive mink. *See* 7 U.S.C. § 8302(13). The importation and interstate movement of mink and materials with mink fur increases interactions between humans, mink, and mink fur, thereby elevating the risk of SARS-CoV-2 transmission. Thus, prohibiting or restricting such movements is necessary to help prevent the introduction or spread of a “pest or disease of livestock.” 7 U.S.C. §§ 8303, 8505.

Second, there is ample precedent for APHIS to take the requested action. APHIS has prohibited or restricted the importation or interstate movement of numerous animal species to prevent the spread of a wide range of pathogens, including: elephants, hippopotami, rhinoceroses, and tapirs to prevent the spread of ectoparasites, *see* 9 C.F.R. §§ 93.800-93.807; zebras to prevent the spread of equine infectious anemia, *see id.* § 75.4; hedgehogs to prevent the spread of foot-and-mouth disease, *see id.* § 75; and land tortoises to prevent the spread of ticks, *see id.* §§ 74.1, 93.701(c). Similarly, no live bird or poultry, or hatching eggs from birds or poultry, may be imported into the United States if they originated from or transited through regions affected by highly pathogenic avian influenza or Newcastle disease. *See id.* §§ 93.101(a), 93.201(a). Placing similar restrictions on farmed mink to prohibit the spread of the SARS-CoV-2 virus would closely parallel these previous actions.

Finally, there is pressing need for action. As discussed above, farmed mink and mink fur are capable of transmitting the SARS-CoV-2 virus to humans, wild mink, and other animals. COVID-19, the disease caused by the virus, poses a potentially deadly threat to humans and mink, and may be dangerous to other species. Infected species or populations (captive or wild) could also become new host reservoirs, potentially creating an opportunity for the virus to mutate or recombine and emerge as a more dangerous variant in the future. Taking the requested action would help to prevent these scenarios from occurring, protect animals and public health, and further the Act’s purpose of preventing, detecting, controlling, and eradicating harmful diseases. For these reasons, APHIS’s strategic plan should commit to proposing prohibiting or restricting the importation and interstate movement of farmed mink and mink products containing fur.

IV. Conclusion

For the reasons described above, APHIS’s strategic plan should place particular emphasis on controlling the spread of SARS-CoV-2 to and from mink fur farm operations. Specifically, the plan should commit to developing an effective early warning for SARS-CoV-2 outbreaks on mink farms, comprehensively monitoring all potential SARS-CoV-2 transmission pathways, and proposing to prohibit or restrict the importation and interstate movement of farmed mink.

Thank you for considering our comments.

Sincerely,

Zack Strong
Senior Staff Attorney
Animal Welfare Institute
(202) 446-2145
zack@awionline.org

PJ Smith
Director, Fashion Policy
The Humane Society of the United States
(301) 366-6074
Pjsmith@humanesociety.org

/s/Hannah Connor

Hannah Connor
Senior Attorney, Environmental Health
Center for Biological Diversity
(202) 681-1676
hconnor@biologicaldiversity.org

/s/Christina Scaringe

Christina Scaringe
General Counsel
Animal Defenders International
(323) 935-2234
ADUSA@ad-international.org

Gillian Lyons
Director of Regulatory Affairs
Humane Society Legislative Fund
(202) 306-5912
glyons@hslf.org

Dr. Liz Tyson
Programs Director
Born Free USA
(830) 965-2813
liz@bornfreeusa.org