

1.3 REASONS FOR CONTROL

There are a variety of reasons for managing urban bird pests. These reasons generally involve health or safety or saving money, or a combination of these.

1.3.1 HUMAN DISEASE TRANSMISSION

Birds are associated with dissemination of the causative agents of a large number of diseases that can affect the health of humans. Some references suggest there are more than 30 such zoonoses that pigeons can pass to humans (ref 35). The disease agents identified include fungi, bacteria and a variety of parasites. Scientific papers implicating wild birds in the dissemination of zoonoses are easily found. Examples include:

<i>Campylobacter spp.</i>	(refs 18, 30)
<i>Chlamydia psittaci</i>	(refs 2, 3, 9, 15, 26, 27, 31, 33)
<i>Cryptococcus neoformans</i>	(refs 19, 29, 33)
<i>Escherichia coli</i> O157	(refs 7, 34)
<i>Histoplasma spp.</i>	(refs 5, 6, 14, 32, 33)
<i>Listeria monocytogenes</i>	(ref 13)
<i>Salmonella spp.</i>	(refs 10, 11, 12, 21, 24, 35)
<i>Vibrio cholerae</i>	(refs 20, 25)

These studies should give pest controllers ample reasons for arguing that birds and their droppings can be a hazard to public health and that bird management could help in preventing the spread of disease. But you need to know the implications of these studies to use this information properly. Whilst it is unfortunate for the individuals concerned, birds are only rarely implicated with specific instances of human disease (though it is likely that the majority of cases go unreported – ref 9). It would therefore usually be unwise to present this factor as the main reason for someone to buy your bird services. You should be aware of the real potential risks, so that they can be presented in the appropriate way.

These diseases can be broadly divided into two categories: air-borne disease and food-borne disease. There is also the possibility of blood feeding insects feeding on birds and then transmitting diseases picked up from them onto man. For example, West Nile Virus infections have been detected in pigeons in the United States. Mosquitoes infected by feeding on infected birds can then bite humans (ref 1). This disease can be fatal to man. In 2002, there were 4,071 confirmed cases in the U.S., with 274 deaths (ref 8). These cases are extremely unlikely to have all been transmitted directly from birds to man.

Air-Borne Diseases - Characteristics

Air-borne disease agents can be either pathogenic microorganisms or dust. The resulting illness can be severe and convalescence very drawn out, possibly extending to months, and death is a possibility. Causative agents that can be inhaled and the symptoms exhibited include:

Chlamydia psittaci - bacteria found in the viscera of infected birds. It is excreted by the faeces and in nasal and eye secretions (ref 26), thus contaminating the birds' feathers, faeces and nesting materials.

A large proportion of feral pigeons can be infected - it has been recorded from over two thirds of feral pigeons in Paris (ref 15) and 49% of pigeons in Zagreb (ref 27).

Human infection is called ornithosis or psittacosis and symptoms include chills, fever, sweating, severe weakness, headache, blurred vision, pneumonia, possibly death. It is not always possible to link exposure to infected birds as the cause of particular human infections and the source of the great majority of human infections in the UK remains a mystery. However, according to the U.S. Centre for Disease Control and Prevention (ref 3), 236 cases of ornithosis in humans were recorded in 33 states of USA, with feral pigeons serving as the source of infection in 19% of cases.

Cryptococcus neoformans - yeast found in accumulated bird droppings. It appears to be gaining in significance in the UK (refs 19 and 29). For most people, infection can appear to be little more than a bout of 'flu, but in susceptible individuals (with damaged or suppressed immune systems), severe systemic infections including pneumonia and meningitis can develop, leading to prolonged hospital stays and sometimes even death.

Histoplasma capsulatum - fungus found in accumulated bird and bat droppings. It is dimorphic, being a yeast when warm and a mould in cooler temperatures. It is of particular significance in North America, though it is also found in other parts of the world (refs 5, 6, 14 and 32). As with cryptococcosis, most people would be unaware they had caught histoplasmosis, but it can lead to hospitalization and even death with a small number of particularly susceptible individuals. Symptoms can include fever, chest pains, cough, pneumonia and meningitis.

Allergenic particles - An allergic condition known as Bird Fancier's Lung (Extrinsic Allergic Alveolitis) occurs among bird keepers and people exposed occupationally to airborne antigens in dust inhaled from bird cages and corpses (ref 17). It can take two forms: acute or chronic. The acute form can lead to intense flu-like symptoms of fever, chills, muscle ache, cough, breathlessness.

Onset of the acute form occurs 4 to 8 hours after exposure to pigeon infestation, but it can strike many years after exposure to the allergen. It usually lasts less than 48 hours, though can last up to a week or more.

The acute phase may be followed by the chronic phase, which is characterized by pulmonary fibrosis, a type of irreversible lung damage. The symptoms include breathlessness on exertion, cough and weight loss. In extreme cases it may be fatal.

Air Borne Diseases - Case Histories

1. Pest control technician contracts ornithosis (ref 27)

A man aged 32 contracted *ornithosis* from pigeon droppings. He had flu-like symptoms and headaches, couldn't stand the light and was off his food. He was off work for almost a month, but it was 6 months before he was 100% again.



Accumulations of pigeon droppings likely to be rich in bacteria and fungi

2. Cryptococcal meningitis on farm (ref 33)

A farm mechanic worked on machinery in a grain-drying building where live pigeons were present. He developed *cryptococcal meningitis* and was hospitalised for 8 weeks. The pigeon droppings from the grain-drying building were found to contain huge quantities of cryptococcal spores. He eventually recovered fully.

3. Steeplejack contracts cryptococcal meningitis (ref 33)

A 46 year old man developed a chronic neurologic syndrome after dismantling a steeple. He was treated for *tuberculosis meningitis* and the symptoms went into remission. One year later he was hospitalized with chronic inflammation of the brain and diagnosed as having *cryptococcal meningitis*. Pigeon droppings had been present in significant quantities in the steeple.

4. Histoplasmosis from starling roost in trees (ref 5)

The dry soil under a starling roost in Iowa was cleared away with a bulldozer. This disturbed spores of *Histoplasma sp.*, which were carried downwind. People up to one mile away contracted histoplasmosis, and the bulldozer driver died after a 7-week illness.



Starling droppings in trees

5. Histoplasmosis from pigeon droppings on catwalk (ref 6)

Pigeon droppings had accumulated to a depth of 30 cm on the catwalk around an Arkansas courthouse tower. Cleanup workers shovelled the dry droppings off the catwalk, allowing them to fall four stories to the ground. Air conditioners picked up the spore-laden dust and distributed it within the building. Of the 84 employees inside, 52% developed *histoplasmosis*. Twenty-four other cases occurred among the construction workers and people who visited the courthouse during the cleanup - one individual contracted the disease after visiting for only 10 minutes.

6. Allergic alveolitis from pigeon droppings on fire escape (ref 9)

A 37 year old mother of five from Rotterdam died after contracting "pigeon lung" from pigeons nesting outside her home. The fire escape outside her home would get pigeon

debris on it and was cleaned regularly by the mother and one child at a time. The mother had the most severe symptoms and died; the children were treated for the disease; and the father who did no cleaning was unaffected.

Food-Borne Diseases - Species

Food-borne disease is mainly caused by bacteria that can live on the food. The resulting illness from these organisms will generally take the form of infections or food poisoning, though in immuno-suppressed or susceptible individuals it might even lead to death. Illness usually occurs shortly after ingestion and is over relatively quickly, though in the case of *Listeria* incubation can take up to 60 days. The incidence of these illnesses being directly transmitted by birds is thought to be low. Disease organisms that can be ingested and the symptoms exhibited include:

- Salmonella* spp. - abdominal pain, diarrhoea, vomiting, fever, headache
- Escherichia coli* variant O157 - severe abdominal pain, bloody diarrhoea, kidney failure, possibly death
- Campylobacter jejuni* - headache, nausea, diarrhoea, abdominal pain
- Listeria monocytogenes* - meningitis, septicaemia
- Vibrio cholerae* - diarrhoea, fever, vomiting, abdominal pain

Food-Borne Diseases - Transmission

10% of samples of pigeons from Rome were found to be carrying *E. coli* (ref 7). Pigeons in Hiroshima City were shown to carry the same strains of *Salmonella* as infected humans there, suggesting the association between pigeons and human salmonellosis (ref 24).

Birds such as gulls, feeding at contaminated sites such as sewage treatment works and sewage outfall pipes, can pick up food poisoning bacteria and pass them out with their droppings on grazing pastures, water reservoirs and other sites which have a significance in the human food chain (refs 10, 11, 12, 13 and 36). Gulls have been implicated in contaminating water sources with *Salmonella* spp. (ref 12), and could spread *E. coli* to cattle (ref 34).

Food-borne bacteria might be spread to humans if you have poor standards of personal hygiene after contacting droppings, but the potential for birds to directly contaminate human food is rather limited. Studies (refs 18 and 30) of the potential for the transmission of *Campylobacter jejuni*, by birds showed that this could occur when milk bottles were pecked. Jackdaws and Magpies were implicated in this. House Sparrows have been shown to carry *Salmonella typhimurium* (ref 21), so if they are infesting a warehouse or supermarket there is a potential for them to spread disease through droppings. In the UK, allowing birds to infest a food business violates the Food Safety (General Food Hygiene) Regulations 1995, and could result in prosecution of the food company.



Pigeons and droppings on vessel in food premises



Food product damaged by sparrows

1.3.2 INSECT AND MITE INFESTATION

Urban birds have a number of blood-feeding parasites that live in their nests and can bite humans. These include: Martin Bug (*Oeciacus hirundinus*), Bird Mites (*Dermanyssus* spp), and Pigeon Flea (*Ceratophyllus columbae*).

The feathers, droppings and dead birds in bird nesting areas can be host to a variety of other insects (refs 15, 16 and 22). These include: Yellow Mealworm Beetle (*Tenebrio molitor*), Lesser Mealworm Beetle (*Alphitobius diaperinus*), Fur Beetle (*Attagenus pello*), Spider Beetles (*Ptinus* spp.), Carpet Beetle (*Anthrenus verbasci*), Larder Beetle (*Dermestes lardarius*), Plaster Beetles (*Cryptophagus* spp.), Hairy Fungus Beetle (*Typhaea stercorea*), Biscuit Beetle (*Stegobium paniceum*), White Shouldered House Moth (*Endrosis sarcitrella*), Brown House Moth (*Hofmannophilla pseudospretella*). Many of these insects will move on to infest fabrics, stored food etc.

When birds die inside buildings, they can become a significant source of carrion-eaters, such as Common Housefly (*Musca domestica*), Lesser Housefly (*Fannia canicularis*), Bluebottles (*Calliphora* spp.), Greenbottles (*Lucilla* spp), and Flesh Flies (*Sarcophaga* spp).

The damp caused by blocked gutters could lead to Booklouse (*Liposcelis bostrychophilus*) infestation. These insects usually live on moulds but will infest food.

Wood enriched with nitrogen from bird droppings is more susceptible to infestation by wood boring beetles such as Furniture Beetle (*Anobium punctatum*).

1.3.3 SAFETY

Bird droppings are a serious slip hazard, for example on pavements below bridges where pigeons are roosting. To reduce the likelihood of being sued by members of the public who slip on droppings, some councils spend thousands of pounds cleaning the pavements under such bridges on a daily basis. Even then those pavements are only safe for a short while before the droppings accumulate again.



Slip hazard of pigeon droppings on pavement

Gulls are becoming an increasing problem in coastal towns where they have started attacking people for food such as fish and chips. They will also take birds and small mammals for food, so have been a significant problem in zoos. In 2000 (ref 4) two seagulls were reported to have "plucked a Yorkshire terrier off a beach in Monaco and dropped it hundreds of yards out at sea where it drowned". Also, the aggressive behaviour of gulls during the breeding season, especially when they have young in the nest, can result in unprovoked attacks on nearby humans and domestic pets.



Newspaper reports of tourists getting attacked by seagulls



Birds getting sucked into jet engines can cause aeroplanes to crash.

Aeroplane brought down by bird strike



Gulls could nest on flues and block them possibly resulting in accumulation of noxious gases inside buildings

Flues with gull nests on them

1.3.4 PROPERTY DAMAGE

Bird droppings are very acid and can cause accelerated deterioration of stonework and corrosion of metals. More of a problem though is the accumulation of nesting materials, droppings and food debris that can block gutters and downspouts. This can lead to flooding and water damage to property. Nests could also block chimneys and flues and lead to dangerous accumulation of noxious fumes inside houses. Birds can also damage property such as window seals, roofing materials and rooftop machinery by pecking. Urban bird pests can also damage crops, particularly fruit crops.



Stonework damaged by pigeon droppings



Gutters blocked by pigeon droppings

1.3.5 IMAGE

Where birds roost or nest or perch, they generally leave fouling. This fouling might smell unpleasant and it doesn't look nice and might put off potential customers to a business. In the case of public buildings it has in some cases lead to them falling into disuse and disrepair.



The starling fouling on this building might deter potential clients for the solicitor working here

1.3.6 JUSTIFYING THE COSTS

The key customer benefits for birdwork:

Reduce health and safety hazards
Save money – now or in the future
Improve relations with staff and customers
Protect from prosecution