

H5 Avian Influenza – Years 9 and 10

Australian Curriculum Links
Learning Area
Science
Biological Science

AC9S9U01

Explain how the interactions of organisms within ecosystems affect biodiversity and ecosystem stability.

AC9SI0U01

Explain how the transmission of heritable characteristics contributes to species diversity and survival and analyse factors that affect the sustainability of ecosystems.

Science as a Human Endeavour

Students learn that:

- Scientific knowledge is continuously refined through the collection and evaluation of evidence.
- Science informs policy and management decisions relating to environmental health, biosecurity and conservation.
- Scientists, governments and community organisations work collaboratively to respond to emerging environmental challenges.

Science Inquiry

Students:

- Develop investigable questions about wildlife disease and ecosystem health.
- Analyse and interpret data from maps, graphs, case studies and scientific reports.
- Evaluate evidence from multiple sources relating to disease outbreaks.
- Draw evidence-based conclusions about biosecurity and conservation strategies.
- Communicate scientific findings using appropriate scientific language and representations.

Cross-Curriculum Priorities

Sustainability

Lesson Plan

Learning Intentions

We are learning to...

... investigate the ecological impacts of H5 avian influenza on wildlife populations and ecosystems.

...explain the ecological impacts of H5 avian influenza.

...examine the role of surveillance systems in detecting and responding to emerging diseases

Success Criteria

We will be successful when we can...

...explain what H5 avian influenza is and how it can spread through animal populations.

... analyse the ecological consequences of disease outbreaks.

...communicate complex scientific information using appropriate terminology.



H5 Avian Influenza in Australia: Biosecurity and Ecosystem Health

H5 avian influenza is a disease caused by influenza A viruses. These viruses are pathogens, meaning they cause disease in living organisms. H5 avian influenza mainly affects birds but can also infect other animals. Infected birds may become seriously ill, and outbreaks can lead to large numbers of deaths.

The disease spreads when a pathogen moves from one host to another. H5 avian influenza can spread through direct contact between infected and healthy birds, as well as through contaminated water, droppings, feathers, and respiratory secretions. Migratory birds travel long distances between habitats and countries. As they move, they can act as vectors, carrying pathogens into new regions and ecosystems.



Figure 1- Short-tailed Shearwaters migrate from the Arctic, across the Pacific Ocean, to Tasmania.

H5 avian influenza can have significant ecological impacts. Birds play vital roles in ecosystems by pollinating plants, dispersing seeds, and acting as predators or scavengers. When disease causes major population declines, these ecological functions may be disrupted. This can affect food webs and the relationships between species.

Outbreaks may also reduce biodiversity, the variety of living things in an ecosystem. Biodiversity helps ecosystems remain resilient and recover from disturbances such as disease, climate events, and habitat loss. When biodiversity decreases, ecosystems may become less stable.

To reduce disease spread, scientists and governments use biosecurity measures. These include monitoring wildlife, cleaning equipment, restricting access to affected areas, and separating domestic poultry from wild birds. Community reports of sick or dead birds can also support investigations. Following the **Avoid, Record, Report (Animal Disease Hotline 1800 675 888)** process helps protect people, wildlife, and ecosystems.

Scientists use epidemiology to investigate how diseases spread through populations. During outbreaks, they collect evidence from field observations, laboratory testing, wildlife monitoring programs, and satellite tracking data. Comparing evidence from multiple sources helps scientists identify patterns of disease transmission and assess risk.



Figure 2- Critically endangered Swift Parrots help pollinate Tasmania's eucalyptus forests.



Lesson Plan

Tuning In

Show students three images without any context:

1. Healthy flock of waterbirds (ducks, swans, pelicans, shorebirds)
2. Several dead birds on a shoreline or wetland
3. Scientists in PPE collecting samples from wildlife

Ask Students:

"These three images are connected. What do you think has happened, and what evidence supports your idea?"

Use a See-Think-Wonder table to record ideas:

See	Think	Wonder
What can you observe?	What might be happening?	What questions do you have?

Explain -

"Scientists rely on evidence to investigate disease outbreaks and make decisions that protect wildlife, agriculture and ecosystems. H5 avian influenza is a biosecurity issue because it has the potential to affect wild birds, domestic poultry and entire ecosystems. Today we will examine how disease spreads, how outbreaks are monitored and why biosecurity is critical to Australia's environmental and agricultural health."

Show students the poster - Avoid • Record • Report

Discuss:

"Why is it important that members of the public do not collect, move or handle sick wildlife themselves?"

"How might reports from the public contribute to scientific investigations?"

Show the HZAA Community Biosecurity webpage and explain that it provides trusted information to help protect Tasmania's wildlife:

<https://www.hzaa.com.au/conservation/community-biosecurity/>

Modelling - I do

Introduce the new vocabulary:

Pathogen -A microorganism, virus, or other biological agent that causes disease.

Exemplar Sentences:

- The pathogen responsible for the outbreak was identified through laboratory testing.
- Scientists studied how the pathogen spread between bird populations.





Vector - An organism that carries a pathogen from one location or host to another.

Exemplar Sentences:

- Migratory birds can act as vectors for avian influenza.
- Researchers tracked vectors to understand disease spread.

Epidemiology - The scientific study of how diseases spread through populations.

Exemplar Sentences:

- Epidemiology helps scientists investigate disease outbreaks.
- Evidence collected through epidemiology can guide management decisions.

Distribute the text and read using your chosen strategy.

Model how to identify:

- **Cause-and-effect relationships.**

Cause: avian influenza causes major declines in bird populations.

Effect: Ecological functions, food webs, and species interactions may be disrupted.

- **Evidence from the text:**

"When disease causes major population declines, these ecological functions may be disrupted. This can affect food webs and the relationships between species."

- **Teacher Think Aloud:**

"I can identify a cause-and-effect relationship because the text explains that disease can reduce bird populations (the cause). Birds play important roles in ecosystems, so when their numbers decline, ecological functions such as pollination, seed dispersal, predation, and scavenging may be disrupted (the effect). The text also states that these changes can affect food webs and relationships between species, showing how one event can lead to further ecological impacts."

Student question to explain cause and effect:

What might be a secondary effect of bird population declines on other species within the ecosystem?



Guided Practice - We do – Check for understanding by answering quiz questions

Why are scientists interested in tracking migratory birds during an avian influenza outbreak?

- A. Migratory birds are the only species that can become infected with avian influenza.
- B. Migratory birds may carry pathogens to new locations, increasing the risk of disease spread.
- C. Migratory birds always cause disease outbreaks wherever they travel.
- D. Migratory birds prevent avian influenza from affecting ecosystems.

Which conclusion can be made about ecosystems with lower biodiversity?

- A. They contain fewer pathogens.
- B. They recover more quickly from disturbances.
- C. They may be less able to cope with future environmental challenges.
- D. They are unaffected by disease outbreaks.

Why might scientists use evidence from several sources before making decisions about an outbreak?

- A. Different sources of evidence can help confirm whether the same conclusion is accurate.
- B. Governments require scientists to collect as much information as possible.
- C. Satellite tracking is not a reliable source of information.
- D. Laboratory testing cannot identify diseases on its own.

Which statement best explains why community reports of sick or dead birds are valuable?

- A. They replace the need for scientific investigations.
- B. They can provide early evidence that helps scientists detect outbreaks.
- C. They prove that avian influenza is always present.
- D. They prevent the disease from spreading.

Independent Practice - You do

Create an engaging and evidence-based awareness **campaign** that informs your school community about **H5 avian influenza** and biosecurity.

Your campaign should:

- Explain what H5 avian influenza is and how it spreads.
- Define biosecurity using scientific language.
- Describe why surveillance and reporting are important.
- Explain the "Avoid, Record, Report" process.
- Include at least four evidence-based actions people can take to reduce disease spread.
- Include the Animal Disease Hotline number: 1800 675 888.





You may present your campaign as:

- An infographic
- A digital presentation
- A scientific poster
- A community awareness brochure

Use diagrams, data, maps and scientific vocabulary to communicate information clearly and accurately.

When completed, use the information you have learnt to write and deliver a one-minute public awareness presentation explaining the importance of biosecurity in protecting wildlife and ecosystems.

Plenary

Share your campaign with a partner and explain:

- Why biosecurity is important for wildlife, agriculture and ecosystems.
- How evidence informs decisions made by scientists and governments.
- Why surveillance and reporting are critical during disease outbreaks.

Key Message

Biosecurity is a shared responsibility.

Avoid

Record

Report - 1800 675 888

By understanding disease transmission and following good biosecurity practices, communities can support wildlife conservation and help protect Australia's unique ecosystems for future generations.

For further information:

Australian Government - <https://www.agriculture.gov.au/campaigns/birdflu>

Department of Natural Resources and Environment Tasmania - <https://nre.tas.gov.au/biosecurity-tasmania/animal-biosecurity/animal-health/poultry-and-pigeons/bird-flu>

Behind the News – Video - <https://www.abc.net.au/btn/classroom/bird-flu/106937876>

Kids News - <https://www.kidsnews.com.au/explainers/eight-ways-australia-can-help-in-the-fight-against-bird-flu/news-story/11fa4aac2b36192130da00a97fda372d>



H5 Avian Influenza & Biosecurity Awareness Campaign

Student Success Checklist

Name: _____

Class: _____

Use this checklist to make sure your campaign includes all required information.

Content

- ☐ I have explained **what H5 avian influenza (bird flu) is**.
- ☐ I have explained **how H5 avian influenza can spread**.
- ☐ I have included a clear definition of **biosecurity**.
- ☐ I have explained **why biosecurity is important** for wildlife, livestock and ecosystems.
- ☐ I have described the **Avoid, Record, Report** process.
- ☐ I have included the **Animal Disease Hotline number: 1800 675 888**.
- ☐ I have explained **how members of the public can help scientists and wildlife experts**.

Scientific Understanding

- ☐ I have used accurate scientific information.
- ☐ I have used at least **three scientific terms** correctly (e.g. biosecurity, pathogen, surveillance, outbreak, ecosystem).
- ☐ I have explained why **evidence is important** when investigating disease outbreaks.

Self-Assessment

I am most proud of...

One thing I could improve...

- ☐ I have described of how H5 avian influenza can affect **wildlife populations and ecosystems**.

Communication

- ☐ My information is clear, concise and easy to understand.
- ☐ I have used headings and subheadings.
- ☐ I have included relevant images, diagrams, maps or symbols.
- ☐ My campaign is visually appealing and organised.
- ☐ My spelling, grammar and punctuation have been carefully checked.

Presentation

- ☐ I have written a short presentation script to accompany my campaign.
- ☐ My presentation explains the key messages clearly.
- ☐ I can explain why biosecurity is everyone's responsibility.
- ☐ I am prepared to share my campaign with the class.

