Project Wetland Science – Teacher's Guide

Message from the Education Specialist

Welcome to *Project Wetland Science*—a unique, whole-ecosystem citizen science program designed to bring authentic fieldwork and scientific inquiry into Western Australian classrooms. By combining cutting-edge research, live data technology, and Indigenous knowledge, your students will experience what it means to work like real scientists, contributing to the understanding and care of our local wetlands.

This guide provides everything you need to plan, prepare, and deliver this engaging learning experience with confidence.

Curriculum Alignment

Western Australian Curriculum v9.0

Year 9 Science – Biological Sciences
- **Science Understanding:** Ecosystems consist of interdependent relationships affected by human activity (AC9S9U01).
- **Science as a Human Endeavour:** Advances in science help people understand the impact of human activity on biological systems (AC9S9H01).
- **Science Inquiry:** Plan and conduct field investigations to collect valid data (AC9S9I01–AC9S9I06).

Year 11 Science in Practice – Context: Environmental Monitoring
- Collect, record, and analyse environmental data to assess ecosystem health.

- Apply workplace safety and ethical practices when conducting environmental investigations.
- Communicate findings using appropriate scientific conventions (report, poster, or digital media).

Also suitable for:
- STEM and Environmental Science electives (Years 9–12)
- School Sustainability and Environment Clubs

Cross-Curriculum Priorities:
- Sustainability
- Aboriginal and Torres Strait Islander Histories and Cultures

Program Overview

Project Wetland Science offers secondary students an authentic opportunity to work alongside Western Australian aquatic scientists and local Indigenous Elders to assess the health of a local wetland. Students gain hands-on fieldwork experience, collect and analyse real data, and communicate their findings through scientific posters or digital media.

This immersive, curriculum-linked program integrates ecology, technology, and cultural knowledge—connecting students to Country and the living systems in their own backyard.

Duration	Setting	Suitable for	Assessment Opportunities
Completed within 1 school term (approx. 8-12 hours)	Classroom & local wetland	Year 9 Science, Year 11 Science in Practice, STEM Clubs Environmental Clubs/Units	Field investigation report, data analysis, poster/website, showcase presentation

Step-by-Step Program Outline

Phase 1 – Teacher Preparation

1. Register your interest and confirm your preferred local wetland (or Bibra Lake in partnership with The Wetlands Centre Cockburn).
2. Book *Professional Learning Workshop* (1 hour online) to upskill in wetland fieldwork safety and ethical sampling practices.
3. Review supplied background materials
4. Prepare students by introducing key concepts: ecosystems, biodiversity, and the cultural significance of wetlands.

We provide:
✓ Teacher Guide & Student Workbook
✓ Data Collection Sheets
✓ Species ID Charts (fish, macroinvertebrates, aquatic plants)
✓ Background info on local wetlands
✓ Templates for student posters and digital submissions

Important: HBI will coordinate all *permits required by DWER and DBCA* for wetland sampling. This ensures compliance with environmental regulations—teachers and students learn the importance of ethical collection practices.

Phase 2 – Pre-Field work

Time Commitment: 2 hours (in-class session)
1. HBI Scientists deliver an engaging classroom presentation introducing their research and field methods. (1 hour)

2. A local Indigenous Elder shares cultural and historical knowledge about the chosen wetland—how it once was and its significance to Country. *Optional in class or at the wetland* (1 hour)

Learning Focus: How science, technology, and culture work together to protect ecosystems.

Phase 3 – Field Investigation

Time Commitment: 3–5 hours (excursion day)
Groups of students work alongside scientists at the wetland, collecting real-world data across four integrated themes:

1. **Turtle Tracking** – using radio telemetry to track snake necked turtle movement and wetland connectivity.
2. **Spyvalve Mussels** – interpreting live-streamed valve-gape and temperature data from mussels at in Peel Harvey region.
3. **Macroinvertebrates** – identifying aquatic species and assessing biodiversity at the wetland/waterway.
4. **Feral Fish (Removal of introduced species)** – seeing how to ethically remove invasive fish species using technology.
5. **Water Quality Testing** – measuring temperature, pH, and conductivity using professional grade digital meters.

Phase 4 – Data Analysis & Interpretation

Time Commitment: 2–3 hours (classroom)
Students analyse their field data alongside/comparing to live Spyvalve mussel data. They interpret their findings to determine indicators of wetland health.

Skills developed:
- Data analysis and comparison
- Drawing conclusions from evidence
- Understanding limitations and reliability

Phase 5 – Communication Workshop & Final Product

Time Commitment: 2 hours (classroom)
Scientists guide students through *How to Design a Scientific Poster* and support groups to produce either - A **Scientific Poster**, or
a **Website Presentation** to communicate findings to a public audience.

Optional: Teachers may combine this with **English, HASS or Digital Technology** curriculum outcomes for multimodal presentation skills.

Phase 6 – Showcase & Community Connection

Time Commitment: 1–2 hour event
Students present their posters or websites at a *Showcase Event* attended by HBI scientists, Indigenous Elder and local council, and community members. Awards are given for excellence in:

- Scientific Research
- Communication
- Indigenous Knowledge Integration

Student posters can be displayed at local wetlands or council facilities, contributing to public education.

Assessment Opportunities

- Fieldwork Report (individual or group)
- Data Table & Graph Analysis
- Poster/Website Presentation
- Reflection on Indigenous knowledge and science collaboration
- Peer and self-assessment options available

Rubrics and templates are provided to align with your selected year level or subject area.

Safety, Permits & Ethics

- All fieldwork will comply with Department of Water and Environmental Regulation (DWER) and Department of Biodiversity, Conservation and Attractions (DBCA) permitting requirements.

- Teachers and students are briefed on safety, minimal disturbance principles, and ethical handling of organisms.
- This is a key learning outcome: understanding that environmental science must meet current legal and ethical standards.

Extension & Community Impact

- Optional long-term data collection for ongoing comparison between years.
- Integration with school sustainability programs or Eco-Schools WA.
- Students contribute to real scientific knowledge, fostering environmental stewardship.

Support & Contact

For bookings and more information
Email: Pauline.Charman@murdoch.edu.au

Website:

Project Wetland Science – Inspiring students to protect the future of Western Australia's waterways through real-world science and cultural learning.