Gorokan High School

Assessment Task

Faculty: Science	**Course: Year 11 Earth & Environmental Science**	**Time allowed: 5 Weeks**
Teacher: Mr Zak Watson		**Email: zak.watson@det.nsw.edu.au**
Task number: 2	**Title: Depth Study Human Impacts**	
Year: 11	**Due date: 25th of July**	**Weighting: 30%**

Syllabus outcomes assessed:

- **EES11/12-1**: Develops and evaluates questions and hypotheses for scientific investigation
- **EES11/12-3**: Conducts practical investigations to collect valid and reliable primary and secondary data
- **EES11/12-5**: Analyses and evaluates primary and secondary data
- **EES11/12-7**: Communicates scientific understanding using appropriate terminology and scientific formats
- **EES11-11**: Describes human impact on the Earth's resources and biological systems

21st Century and employment related skills:

☒	Communication	☒	Use of technology
☒	Critical Thinking	☐	Self-reflection and refinement
☒	Creativity	☐	Problem Solving
☐	Collaboration	☐	Initiative and Enterprise
☒	Planning and Organising	☐	Cross-Cultural Understanding

Task description:

You are now stepping into the role of a field ecologist. Your task is to conduct a scientific investigation into the impacts of human activity on the unique ecosystem of Strickland State Forest. This area faces environmental challenges such as the spread of invasive species including *Lantana camara* and *Gambusia holbrooki*, habitat modification, and Bell Miner-associated dieback. These pressures threaten native biodiversity and long-term ecosystem health.

Results	Present your collected data using tables, graphs, photos (captioned). Use correct units and labels.	Visuals + 200 words explanation
Discussion	Deep analysis of findings. Evaluate biotic/abiotic impacts of human activity. Discuss ecosystem changes. Link to scientific literature and course content.	600 words
Recommendations	Evidence-based solutions for managing or restoring ecosystem health.	200 words
Conclusion	Brief summary of key findings and their implications.	100 words
References	Use APA or Harvard referencing. At least 3 credible secondary sources.	Not included in word count

Assessment criteria:

Students will be assessed on:

1. Scientific Inquiry and planning – clear hypothesis, strong understanding of ecological concepts, and effective investigation design.

2. Data collection and processing – accurate field data collection, clear presentation of data using scientific conventions, and integration of secondary sources.

3. Analysis and Interpretation – logical analysis, connection to ecological theory, evaluation of human impacts, and consideration of reliability and limitations.

4. Scientific communication – clear report structure, correct scientific language, proper referencing, and thoughtful recommendations.

Year 11 Earth & Environmental Science

2025 Year 11 Depth Study *Human Impacts-Strickland Forest*

General Instructions

Total Marks: 45
Time Allowed: 5 Weeks (including 15 hours of class time and fieldwork)
Due Date: 25th of July
Weighting: 30%
Teacher: Mr Zak Watson
Email: zak.watson@det.nsw.edu.au

Syllabus Outcomes Assessed

EES11/12-1: Develops and evaluates questions and hypotheses for scientific investigation
EES11/12-3: Conducts practical investigations to collect valid and reliable primary and secondary data
EES11/12-4: Selects and processes appropriate qualitative and quantitative data and information
EES11/12-5: Analyses and evaluates primary and secondary data
EES11/12-6: Solves scientific problems using data, critical thinking, and scientific processes
EES11/12-7: Communicates scientific understanding using appropriate terminology and scientific formats
EES11-11: Describes human impact on Earth's resources and biological systems

Task Overview

You are now stepping into the role of a professional field ecologist. Your task is to conduct a scientific investigation into the impacts of human activity on the unique ecosystem of Strickland State Forest. You will examine environmental pressures such as invasive species (Lantana camara, Gambusia holbrooki), habitat modification, and Bell Miner-associated dieback.

Your guiding inquiry question is:

"How have human activities influenced the abundance and distribution of native and invasive species in the Strickland State Forest ecosystem, and what are the implications for long-term ecological health?"

Your task is to apply scientific field techniques, analyse your data, evaluate ecological changes and propose evidence-based management strategies, then communicate your findings in a professional ecological report.

Fieldwork – Data Collection and Analysis

You will use the following ecological techniques in the field:

- Quadrat sampling to assess abundance and distribution of plant species
- Water quality testing (pH, turbidity, temperature)
- Abiotic factor measurement (light, temperature, moisture)
- Macroinvertebrate survey to assess waterway health
- Field sketches and photos as supporting evidence

Your Task: Scientific Ecological Report

You are to submit a scientific report following the structure below. Use subheadings and formal scientific language. You must provide evidence for all claims and include in-text citations using APA or Harvard style.

Report Structure & Requirements

1. Title Page (Not included in word count)

- Your full name
- School name
- Task title
- Course name
- Date of submission

2. Executive Summary (~200 words)

- Clearly state the purpose of the investigation
- Highlight key findings from data analysis
- Include major human impacts observed
- Provide an overview of your recommendations

3. Introduction (~200 words)

- Describe the ecological significance of Strickland State Forest
- Identify human activities affecting the area (e.g. invasive species, habitat modification)
- Outline why it is important to study these impacts
- Link to relevant syllabus content (ecosystem dynamics, interdependence)

4. Aim & Hypothesis (~100 words)

- Clearly state one scientific aim
- Write a testable hypothesis using "If...then...because..." structure
- Justify using scientific knowledge and prior research

5. Methodology (~300 words)

- Provide a detailed description of each fieldwork technique
- List materials and equipment
- Identify and define variables (independent, dependent, controlled)
- Explain how validity, reliability, and accuracy were ensured
- Address risk assessment and field safety

6. Results (Visuals + ~200 words)

Present raw and processed data using:

- Tables (with titles)

- Graphs (with axis labels and units)

- Captioned photographs and field sketches

- Use scientific units throughout
- Provide a brief written description of patterns, trends, and anomalies

7. Discussion (~600 words)

- Analyse and interpret your results
- Link patterns in your data to ecological theory and syllabus content
- Discuss the impacts of human activity (e.g. invasive species competition, habitat loss)
- Incorporate at least three credible secondary sources (cited)
- Evaluate the strengths and limitations of your investigation (e.g. sample size, methods)

8. Recommendations (~200 words)

- Propose realistic, evidence-based strategies for conservation or restoration
- Justify each recommendation with your data and/or scientific research

9. Conclusion (~100 words)

- Restate your findings in a concise way
- Briefly explain the importance of your findings for future ecosystem management

10. References (Not included in word count)

- Use APA or Harvard referencing style
- Minimum 3 credible scientific sources (journals, government reports, textbooks)
- Ensure all in-text citations are matched in the reference list

Questions to Guide Your Discussion Section

- What do your results reveal about human influence on native biodiversity?
- Are there any long-term trends or risks to ecosystem health?
- How do abiotic changes link to species distribution?
- What can be done to mitigate further damage?
- How does your data compare to existing scientific research?

Submission Guidelines

- Submit your printed report to the school library on the due date
- Late submissions may incur penalties in line with the school assessment policy

Performance Band Descriptors – Year 11 EES Depth Study

Band	Descriptor
A	- Extensive knowledge and understanding of ecological concepts - Sophisticated analysis of valid, reliable data - Clear scientific communication with correct use of terms - Seamless integration of primary and secondary sources - Professional, structured report with deep insight into human impact
B	- Thorough understanding and clear analysis of data - Well-structured and scientifically accurate report - Consistent use of terminology and valid sources - Logical conclusions with minor omissions
C	- Sound understanding and basic analysis - Appropriate use of report structure and data formats - Some scientific terminology used correctly - Conclusions drawn from evidence with some detail lacking
D	- Basic understanding with limited analysis - Incomplete data or poor formatting - Minimal attempt at scientific language or referencing
E	- Limited understanding and no analysis - Inadequate or missing report sections - Little or no attempt at using scientific format or terminology

Year 11 Earth & Environmental Science Depth Study Marking Criteria

Depth Study – Ecological Field Report (Strickland State Forest)

Student Name: _____

Section	Criteria	Outcome	Mark /3
Executive Summary	• Clearly outlines purpose of investigation • Summarises key findings • Provides realistic recommendations • Professional and concise scientific language	EES11/12-7	

Section	Criteria	Outcome	Mark /3
Aim & Hypothesis	• Aim is specific and measurable • Hypothesis is testable and relates to ecological concepts • Demonstrates scientific reasoning	EES11/12-1	

Section	Criteria	Outcome	Mark /6
Methodology	• Fieldwork methods described (e.g. quadrats, transects) • Variables (independent, dependent, controlled) identified • Reliability, validity and safety addressed • Methods are justified	EES11/12-3	

Section	Criteria	Outcome	Mark /6
Results	• Data presented using graphs, tables, images • Appropriate formatting (titles, units, axes, captions) • Clear explanation of patterns or trends	EES11/12-4	

Section	Criteria	Outcome	Mark /12
Discussion	• Analyses data (biotic and abiotic) • Evaluates human impacts • Links findings to ecological concepts • Uses secondary sources for support • Demonstrates critical thinking and insight	EES11/12-5	

Section	Criteria	Outcome	Mark /3
Recommendations	• Suggests realistic, evidence-based strategies • Considers Indigenous or local knowledge • Links to field data and findings	EES11/12-6	

Section	Criteria	Outcome	Mark /2
Conclusion	• Summarises key findings clearly • Reconnects to aim and hypothesis • Highlights ecological significance	EES11/12-7	

Section	Criteria	Outcome	Mark /3
References	• At least 3 credible secondary sources • Correct in-text APA referencing	EES11/12-4	

	• Full APA reference list included		

Section	Criteria	Outcome	Mark /3
Communication & Structure	• Clear report format with headings • Formal scientific language used • Free from major spelling/grammar issues	EES11/12-7	

NESA Outcome Tally – Total Marks

NESA Outcome	Description	Marks
EES11/12-1	Inquiry question & hypothesis	3
EES11/12-3	Conducts investigations	6
EES11/12-4	Processes data & sources	9
EES11/12-5	Analyses & evaluates data	12
EES11/12-6	Applies scientific knowledge	3
EES11/12-7	Communicates understanding	12

Total Mark: _____ / 45

General Comments: