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**Year 12 Integrated Science 2020**

**Task 1: Extended Response - Wetlands in Western Australia**

**Background Information**

Wetlands are vital for human survival. They are among the world’s most productive environments; cradles of biological diversity that provide the water and productivity upon which countless species of plants and animals depend for survival.

Wetlands are indispensable for the countless benefits or “ecosystem services” that they provide humanity, ranging from freshwater supply, food and building materials, and biodiversity, to flood control, groundwater recharge, and climate change mitigation.

Yet study after study demonstrates that wetland area and quality continue to decline in most regions of the world. As a result, the ecosystem services that wetlands provide to people are compromised.

Western Australia’s unique and diverse wetlands are rich in ecological and cultural values and form an integral part of the natural environment of the state.

**Task**

You are tasked with completing a research assignment on a significant wetland from Western Australia. The assignment involves:

* a set of research notes (see below for specifics)
* A 5 min presentation (powerpoint, video, poster, other) that outlines the key information from your research.

You need to choose one of the following wetlands (no more than 2 students can do each wetland).

* Becher Point Wetland
* Forrestdale and Thomson lakes
* Lake Gore
* Muir-Byenup System
* Ord River floodplain
* Roebuck Bay
* Lake Toolibin
* Vasse-Wonnerup System
* Peel-Yalgorup System
* Lake Warden
* Lake Argyle and Kununurra

**Key Dates**

Research Notes: Mon 10th – Thurs 13th Feb (3 lessons)

In-class presentation: Thurs 20th Feb 2020

**Task Weighting**

15% of the year mark.

**Total marks available**

60 marks

**Part 1: Research Notes [39 marks]**

You are required to research the answers for the following questions.

Your notes need to be:

* Written in your own words. ANY SECTIONS THAT ARE PLAGIARISED WILL NOT BE MARKED.
* Concise, using dot points where applicable.
* Correctly referenced (in-text and bibliography).

Your research notes **WILL** need to be submitted to your teacher at the beginning of the lesson of the final presentation.

**Useful resources**

<https://www.dpaw.wa.gov.au/management/wetlands>

<https://www.environment.gov.au/water/wetlands/ramsar/criteria-identifying-wetlands>

<https://www.environment.gov.au/water/wetlands/australian-wetlands-database/australian-ramsar-wetlands>

**Part 2: Presentation [21 marks]**

With the information you have collected through your research, produce a 5-minute presentation that will engage the viewer (your fellow peers). Your presentation must include all key information from your research. You can choose any presentation type you think applicable to present this information.

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| --- | --- | --- | --- |
| **Description** | **3 marks** | **2 marks** | **1 mark** |
| Presentation of content   * PowerPoint * Video * Online website * Poster | 8-10 slides/sections included with key ideas linked to images and sources of information referenced. | 8-10 slides/sections included that shows organisation of ideas in each of the researched content areas. | 7 slides/sections included that is mainly text. |
| Content | Shows a full understanding of the topic | Shows a good understanding of the topic | Shows some understanding of the topic |
| Use of headings and sub-headings | All headings and subheadings used. | Some headings and subheadings used. | Some headings used |
| Delivery | Speaks with fluctuation in volume and inflection to emphasize key points. | Speaks with satisfactory variation of volume and inflection. | Speaks in uneven volume with little or no inflection. |
| Creativity | Creative use of fonts, transitions or animation function that includes a short-embedded clip/s that have been produced by the student | Some attempt to use transitions or animation functions on PowerPoint. | Some relevant images used and an attempt made to use colour, smart art or different fonts. |
| Audience interest | Engaging and interesting all the way through. | Captured interest reasonably well. | Relevant information is included. |
| Engagement | High level of effort. | Satisfactory level of effort. | Little effort shown. |
| **Total** | **/21** | | |

**Marking Guide**

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|  | **Item Description** | **Marks** |
| Research Notes | 1. *Wetland description*   Clearly define what constitutes a wetland  Outline the different types of wetlands and what makes them important. | 2/2 |
| 1. *Ramsar Convention*   Correctly define what the Ramsar Convention is and clarify why is it important? | 2/2 |
| 1. *Justification*   Identify which Ramsar Criteria your WA wetland qualifies for.  Clearly explain using multiple points how your WA wetlands meets this Ramsar Criteria. | 4/4 |
| 1. *Map*   Provide a map of your WA wetland site (include geographical coordinates and location of nearest town or major town/city).  Ensure that you clearly delineate the various types of wetlands within your site. | 3/4 |
| 1. *Key Features*   Analyse and describe the key features of your WA wetland site (biogeography, physical conditions, hydrological values, wetland type). | 8/8 |
| 1. *Fishbone*   Use the Fishbone Template to classify noteworthy biotic factors (flora and fauna) that inhabit your WA wetland.  For each, describe what makes each one noteworthy. | 0/6 |
| 1. *Social/Cultural Values*   Describe if the site has any social and/ or cultural values and detail what makes them important. | 3/4 |
| 1. *Ecological Condition of your WA wetland*   Analyse how current land and water use activities within the Ramsar site and surrounding catchment are affecting the ecological character of your WA wetland. | 4/6 |
| 1. *Referencing*   Include in-text referencing and provide a bibliography. | 2/3 |
| **Research Notes Sub Total** | | **28/39** |
| Presentation | Presentation of content | 3/3 |
| Content in presentation | 3/3 |
| Use of headings | 3/3 |
| Delivery | 3/3 |
| Creativity | 3/3 |
| Audience interest | 3/3 |
| Engagement | 3/3 |
| **Presentation Sub Total** | | **21/21** |
| **TOTAL** | | **49/60**  **81.7%** |

**Part 1: Research Notes**

1. **Wetland description (Define what constitutes a wetland and describe the different types of wetlands and what makes them important).**  **(2 marks)**

Wetlands are natural or manmade low areas saturated with underground or surface water. They can be permanently, seasonally or intermittently inundated with water. The wet conditions are frequent and persist long enough to sustain plants and animals that have become adapted to inhabiting water-saturated soil and larger bodies of water.

Wetlands typically fit into the categories of permanently inundated, seasonally inundated, intermittently inundated or occasionally waterlogged. The elevation of the earth also factors into the formation of wetlands. They can be formed on basins, flats, channels, slopes and highlands.

Some common types of wetlands in Australia are:

* Coral reefs
* Marshes
* Billabongs
* Rivers
* Reserves

Wetlands have crucial roles in our society both for practical reasons such as for drinking and infrastructure as well as for cultural purposes. They are also important environmentally as they create habitats for many types of fish, reptiles and waterfowls. Many wetlands also used by scientists for conducting research as well as absorbing pollution.

Where are your intext references for this question?

1. **Describe what the Ramsar Convention is and clarify why it is important.** **(2 marks)**

Also known as the Convention of Wetlands, the Ramsar Convention contains a criterion for listing wetlands based on significance for the sake of preservation. This can be because a wetland is representative, rare and unique, or diverse in its ecology, botany, zoology, limnology, or hydrology. Wetlands are also enlisted on the basis that it can sustain 1% of local species and migratory waterfowl or is crucial in their lifecycle. The convention was signed in 1971 and put into action in 1975.

In recent history, the intensive use of agricultural practices has taken its toll on wetlands. Studies conducted by the DEE (Department of the Environment and Energy, 2020) show pollution and other harmful factors have caused a decline in wetlands numbers worldwide. The Ramsar Convention aims to protect wetland reserves and cease the declining numbers. All over the world wetlands are culturally significant, provide animals with habitats and absorb pollutants from the air. Here in Australia there are 65 wetland reserves which we use for agriculture, infrastructure, power and as Aboriginal landscapes.

1. **Identify which Ramsar Criteria your WA wetland qualifies for.**  **(1 mark)**

The lakes Argyle and Kununurra are Ramsar sites made of systems of freshwater reserves. They cover an area of 117,495 hectares. The lakes Argyle and Kununurra are listed in the Ramsar Convention under the criterions 2, 3, 4 and 5.

**3a. Clearly explain using multiple points how your WA wetlands meets this Ramsar Criteria.** **(3 marks)**

Criterion2: Sustains and maintains nationally listed vulnerable wildlife including freshwater crocodiles.

Criterion 3: Multiple species of fish, turtles, tortoises, waterfowls and retiles inhabit the lakes and surrounding areas in significant populations.

Criterion 4: Plays a critical role in supporting sustaining waterfowls during drought and dry seasons.

Criterion 5: Sustains a significant population of waterfowls. A study in 1986 showed 180,000 birds inhabit the lakes and surrounding areas.

**Intext references?**

1. **Provide a map of your WA wetland site (include geographical coordinates and location of nearest town or major town/city). Ensure that you clearly delineate the various types of wetlands within your site.**

**3**(4 marks)

A close up of a map

Description automatically generated

1. **Analyse and describe the key features of your WA wetland site, include the following: biogeography, physical conditions (including climate data), hydrological values, wetland type.** **(8 marks)**

Formed from the damming of the River Ord, lakes Argyle and Kununurra are situated in the northern Regions of WA. Lake Kununurra is close to the regional town of Kununurra and the lake Argyle is downstream. Lake Argyle is the largest freshwater reserve in the region. The Ord and Bow rivers flow into Argyle while lake Kununurra extends to the mouth of Argyle.

The lakes Argyle and Kununurra are included in the Kimberley region of WA. As the Kimberley is in the tropics the climate consists solely of wet and dry seasons (Kimberley Climate – Wet Season and Dry Season, 2020, p.1). The dry season, also called the Monsoon, the climate is very stable and predictable; clear skies, wind and temperatures exceeding 40 degrees. It never rains during this stage. The wet seasons are far less predictable and often more violent. The air becomes humid and stagnant, cyclones are prevalent and 200mm of rainfall can be expected monthly.

Numerous species of fish, turtles, tortoises, reptiles and waterfowls inhabit the lakes Argyle and Kununurra (Department of the Environment and Energy, 2020). During the dry season when other lakes become dry a recorded 200,000 migratory waterfowls flock to the sites. Since 1963 the lakes have become breeding grounds for vulnerable reptile species, particularly the north-western red-faced tortoise and freshwater crocodiles.

While the lake Kununurra and the areas surrounding the Kununurra, town have consistent water levels throughout the year, the fluctuating water levels of lake Argyle have made vegetation growth scarce and sporadic along the shores, save for dense belts of groves. The consistency of lake Kununurra has formed swamps in the surrounding areas. These swamps contain aquatic grasses, grassland and woodland. Dead trees can be found in either lake as a result of the area becoming permanently flooded. These dead trees become roosts and groves for plants and schools of fish.

1. **Use the Fishbone Template to classify noteworthy biotic factors (flora and fauna) that inhabit your WA wetland. For each, describe what makes each one noteworthy.** **0**(6 marks)

[\*\*\*]

**??? Your fish bone isn’t completed at the end of the document.**

1. **Describe if the site has any social and/ or cultural values and detail what makes them important.**

**3**(4 marks)

The lakes and surrounding areas are native homes of the Miriuwung and Gajerrong peoples (Native Title Map – Kimberley Land Council, 2020, p.1). In 2003 the federal government recognized the cultural significance of the lakes Argyle, Kununurra and Kununurra town to the inhabiting people. In 2006 The Miriuwung and Gajerrong peoples were also acknowledged as the longest lasting claimants if the land.

**What other ways is the land used-socially could mean tourism too.**

1. **Analyse how current land and water use activities within your site and the surrounding catchment are affecting the ecological character of your WA wetland.**  **4**(6 marks)

The lack of suitable land for development in the Kununurra town has led to the expansion of the towns borders into the areas surrounding the lakes Argyle and Kununurra. The areas cleared by the pressures of land development has noticeably displaced animal populations and removed groves, drying up the outskirts of the sites.

Recently, sediments and other contaminants have been found in the aquafers in lake Kununurra (Drinking Water Supply Protection Plan, 2020, p.4). The State Government of WA is pushing for the reserves to be considered priority 1 as they are the only sources or drinking water for the Kununurra town.

**What contaminants have been found?**

**What is the lake used for? Tourism, bird watching?**

1. **Bibliography (Referencing)** **2**(3 marks)

**Anon**

(2020). Retrieved 10 February 2020, from <https://www.water.wa.gov.au/__data/assets/pdf_file/0007/4498/43171.pdf>

**Department of the Environment and Energy**

Department of the Environment and Energy. (2020). Retrieved 10 February 2020, from <https://www.environment.gov.au/water/wetlands/ramsar/criteria-identifying-wetlands>

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Department of the Environment and Energy. (2020). Retrieved 10 February 2020, from https://www.environment.gov.au/water/wetlands/ramsar

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Department of the Environment and Energy. (2020). Retrieved 10 February 2020, from https://www.environment.gov.au/water/wetlands/australian-wetlands-database/australian-ramsar-wetlands

**Lakes Argyle and Kununurra - Australian Ramsar site no. 32**

Lakes Argyle and Kununurra - Australian Ramsar site no. 32. (2020). Retrieved 10 February 2020, from https://www.environment.gov.au/cgi-bin/wetlands/ramsardetails.pl?refcode=32

**Native Title Map — Kimberley Land Council**

Native Title Map — Kimberley Land Council. (2020). Retrieved 10 February 2020, from https://www.klc.org.au/native-title-map

**The Kimberley Climate - Wet Season and Dry Season**

The Kimberley Climate - Wet Season and Dry Season. (2020). Retrieved 10 February 2020, from https://www.kimberleyaustralia.com/kimberley\_climate.html

**Wetlands - Parks and Wildlife Service**

Wetlands - Parks and Wildlife Service. (2020). Retrieved 10 February 2020, from https://www.dpaw.wa.gov.au/management/wetlands

**Awesome references, just missing a few in-text references.**

