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**Year 12 Integrated Science | SEMESTER 1 – 2019**

**Task 1 - Unit 3: Estuarine Wetlands in Western Australia**

**Assessment type:** Extended Response

**Conditions:**

Time allocation for completion of the task:

* Research: three (3) x 60-minute class lessons (Part 1).
* Presentation: 5 minute class lesson (Part 2)

|  |  |  |
| --- | --- | --- |
| **Task Weighting:** | **Task Marks:** | **Due Date:** |
| 10% of the year mark. | \_\_\_\_\_\_\_\_\_\_\_ / 56 marks | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Estuarine Wetlands in Western Australia**

Western Australia’s unique and diverse wetland are rich in ecological and cultural values and form an integral part of the natural environment of the state. Your local Creery Wetland Nature Reserve (CWNR) is listed as part of system of ‘Wetland of International Importance’ under the Ramsar Convention.

**Task**

You will need to complete a research assignment on the CWNR and present a 5 minute presentation of your research using either of the following format:

* A PowerPoint presentation (no more than 10 slides),
* A video,
* An online interactive website,
* A poster (minimum size A3),
* Another medium if approved after discussion with the teacher.

**Part 1: Research Phase [total 35 marks]**

You will be provided nine (9) questions that you need to research. To support your research the following will be provided:

1. A notetaking template
2. A Fishbone template
3. A number of class lessons will be designed covering some questions
4. A document titled “An information sheet on Ramsar Wetlands” will be provided
5. You will conduct a field trip to the site where you can read the signage provided
6. Internet access will be provided: two places you may like to start include:

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

<http://www.creerywetlands.info/>

Your notes should include:

* Be written in concise dot points in your own words
* Correctly include a bibliography [5 marks]

Include the following in your response: [30 marks]

1. Write a brief description of what are wetland? [already done for you = 0 marks]
2. Define what the Ramsar Convention is clarify why is it important? [2 marks]
3. Identify the name of the Ramsar site that the CWNR is part of? [1 mark]
4. Justify one reason of how the CWNR site meet one of the nine qualifying Ramsar criteria. [3 marks]
5. Wetlands have been mapped in some areas of Western Australia.
   1. Provide a map of the wetlands of Western Australia (include geographical coordinates and location of nearest or major town/city to wetland) , and [2 marks]
   2. Provide a map of the Ramsar site that the CWNR is part of (include geographical coordinates and location of nearest town or major town/city). [2 marks]
6. Analyse some key features of the CWNR (biogeography, physical conditions, hydrological values, wetland type). [4 marks]
7. Use a Fishbone Template to classify noteworthy biotic factors (flora and fauna) that inhabit the CWNR. [6 marks]
8. Describe if the site has any social and/ or cultural values. [4 marks]
9. Analyse how the current land and water use activities within the Ramsar site and surrounding catchment are affecting the CWNR ecological character. [6 marks]

Your notes from the research phase **WILL** need to be submitted to your teacher during your final presentation.

**Part 2: Presentation Phase [total 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 information that answers the 9 questions above.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Marks Allocated** | | |
| **Description** | **3.0** | **2.0** | **1.0** |
|  |  |  |  |
| 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** |  |  |  |
| **Overall total** | | | **/ 21** |

**Student Worksheet**

To support your research the following support has been provided:

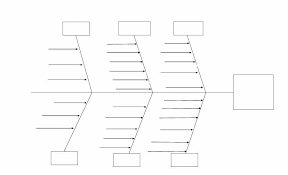
1. A notetaking template
2. A Fishbone template
3. A number of class lessons will be designed covering some questions
4. A document titled “An information sheet on Ramsar Wetlands” will be provided
5. You will conduct a field trip to the site where you can read the signage provided
6. Internet access will be provided: two places you may like to start include:

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

<http://www.creerywetlands.info/>

|  |  |
| --- | --- |
| **Note Taking Template** | **Mark** |
| 1. **Write a brief description of what are wetland?**   **\* NOTE: this has already been done for you to demonstrate the teachers expectations \*** | **[1-2]** |
| * **Definition:**   Wetlands are areas either temporarily or permanently covered by water and can be either natural or artificial with water that is still or flowing, fresh, brackish (slightly salty) or salty. This includes marine water which is no more than six metres deep at low tide. | **1/1** |
| * **Other interesting points:**   Wetlands often include riparian zones (land which adjoins or directly influences a body of water) and coastal zones adjacent to the wetlands, as well as islands. | **1/1** |
| 1. **Define what the Ramsar Convention is clarify why is it important?** | **[1-2]** |
| * **Definition:** | **1** |
| * **Other interesting points:** | **1** |
| 1. **Identify the name of the Ramsar site that the CWNR is part of?** | **[1]** |
| * **Name** | **1** |
| 1. **Justify one reason of how the CWNR site meet one of the nine qualifying Ramsar criteria.** | **[1-3]** |
| * **Group letter and Group Name:** | **1** |
| * **Criterion number:** | **1** |
| * **Criterion definition:** | **1** |
| 1. **Wetlands have been mapped in some areas of Western Australia.**   **a). Provide a map of the wetlands of Western Australia (include geographical coordinates and location of nearest or major town/city to wetland) , and** | **[1-2]** |
| * **Latitude and Longitude:** | **1** |
| * **Towns/Cities** | **1** |
| **b). Provide a map of the Ramsar site that the CWNR is part of (include geographical coordinates and location of nearest town or major town/city).** | **[1-2]** |
| * **Latitude and Longitude:** | **1** |
| * **Towns/Cities** | **1** |
| 1. **Analyse some key features of the CWNR (biogeography, physical conditions, hydrological values, wetland type).** | **[1-4]** |
| * **Climate: Name and description** | **1** |
| * **Soil type: Name and description** | **1** |
| * **Wetland description** | **1** |
| * **Name of main rivers, channels artificial drainage that flow into the area** | **1** |
| 1. **Use the Fishbone template to classify noteworthy biotic factors (flora and fauna) that inhabit the CWNR.** | **[1-6]** |
| * **Flora \* WRITE ANSWER ON FISHBONE TEMPLATE \*** | **3** |
| * **Fauna \* WRITE ANSWER ON FISHBONE TEMPLATE\*** | **3** |
| 1. **Describe if the site has any social and/ or cultural values.** | **[1-4]** |
|  | **1** |
|  | **1** |
|  | **1** |
|  | **1** |
| 1. **Analyse how the current land and water use activities within the Ramsar site and surrounding catchment are affecting the CWNR ecological character.** | **[1-6]** |
|  | **1** |
|  | **1** |
|  | **1** |
|  | **1** |
|  | **1** |
|  | **1** |
| **Other noteworthy information** |  |
|  |  |
| * **Bibliography:**   *For example:*  *Art* + soul : a journey into the world of aboriginal *art* *2010, television program, Australian Broadcasting Corporation, Sydney, 4 October.*  *Centres for Disease Control and Prevention (1994) Epi Info (Version 6) [Computer program]. Available at*[*http://www.cdcp.com/download.html*](http://www.cdcp.com/download.html)*(Accessed: 23 June 2015).*  *Davidson, A. (2013) ‘The Saudi Marathon Man’, The New Yorker, 16 April. Available at: http://www.newyorker.com/news/daily-comment/the-saudi-marathon-man (Accessed: 22 June 2015).*  *Department of the Environment and Energy, 2019, accessed 1st January 2019, http://www.environment.gov.au/water/wetlands/about*  *Google Earth 6.0. 2008. Hylands House and estates 51°42'39.17"N, 0°26'11.30"W, elevation 60M. 3D Buildings data layer, viewed 31 August 2011,* [*http://www.google.com/earth/index.html*](http://www.google.com/earth/index.html)  *Gough, P 2017,* What makes art good or bad?*, video recording, Youtube, viewed 17 July 2017* [*https://www.youtube.com/watch?v=XNQVe4qgtx8*](https://www.youtube.com/watch?v=XNQVe4qgtx8)  *Jones, B., (1997) Methods in tumour research. National Agency for Tumour Research, volume. 7.*  *Ubisoft Entertainment 2012,*Assassins creed III*, computer program, Ubisoft Australia.*  *The University of Birmingham (2010) The University of Birmingham experience. Available at:*[*https://www.youtube.com/watch?v=YLxV5L6IaFA*](https://www.youtube.com/watch?v=YLxV5L6IaFA)*(Accessed: 18 June 2015).* |  |
|  |  |

**STUDENT FISHBONE TEMPLATE** [6 marks]



**Teachers Marking Key**

**[56 marks]**

**Unit content**

This assessment covers the following key concepts.

**Science Inquiry Skills (SIS)**

* interpret a range of scientific and media texts and evaluate the conclusions by considering the quality of available evidence (SIS5),

**Science as a Human Endeavour (SHE)**

* the use of scientific knowledge is influenced by social, economic, cultural and ethical considerations (SHE1),
* the use of scientific knowledge may have beneficial and/or harmful and/or unintended consequences (SHE2),
* scientific knowledge can enable scientists to offer valid explanations and make reliable predictions (SHE3),
* scientific knowledge can be used to develop and evaluate projected economic, social and environmental impacts, and to design action for sustainability (SHE4).

**Science Understanding (SU)**

**Earth systems/cycles in nature**

* differences in geographical and physical conditions result in a wide variety of ecosystems (SU1),
* there is interaction between organisms, biological communities and the abiotic environment in which they live (SU3),

**Ecosystems and sustainability**

* human interference is threatening biodiversity through deterioration of ecosystems and diminishing habitat areas (SU13).

1. **Research Phase: Notes [5 marks]**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Description** | **2.5** | **2.0** | **1.5** | **1.0** | **0.5** |
| Notes as a series of dot points | 80% | 60-79% | 41-59% | 40-49% | <39% |
| Bibliography | <4  Correct format | 4 | 3 | 2 | 1 |
| Total |  |  |  |  |  |
| **Overall Total** | | | | | **/ 5** |

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **3.0** | **2.0** | **1.0** |
|  |  |  |  |
| 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. |
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| 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. |
| Effort | High level of effort. | Satisfactory level of effort. | Little effort shown. |
| **Total** |  |  |  |
| **Overall total** | | | **/ 21** |

**Part 1 and 2: Research information [30 marks]**

|  |  |
| --- | --- |
| **Description – Answers may include but are not limited to the following** | **Mark** |
| 1. **Write a brief description of what are wetland?**  * Wetlands are areas either temporarily or permanently covered by water and can be either natural or artificial with water that is still or flowing, fresh, brackish (slightly salty) or salty. This includes marine water which is no more than six metres deep at low tide. * Wetlands often include riparian zones (land which adjoins or directly influences a body of water) and coastal zones adjacent to the wetlands, as well as islands. | **Already done for you** |
| 1. **Define what the Ramsar Convention is clarify why is it important?**  * The Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat is an international [treaty](https://en.wikipedia.org/wiki/Treaty) for the conservation and sustainable use of [wetlands](https://en.wikipedia.org/wiki/Wetland).[[2]](https://en.wikipedia.org/wiki/Ramsar_Convention#cite_note-ramsar-2) It is also known as the Convention on Wetlands. It is named after the city of [Ramsar](https://en.wikipedia.org/wiki/Ramsar,_Mazandaran) in [Iran](https://en.wikipedia.org/wiki/Iran), where the Convention was signed in 1971. | **1-2** |
| 1. **Identify the name of the Ramsar site that the CWNR is part of?**  * Peel – Yalgorup System | **1** |
| 1. **Justify one reason of how the CWNR site meet one of the nine qualifying Ramsar criteria.**  * **Group A of the Criteria. Sites containing representative, rare or unique wetland types**   Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.   * **Group B of the Criteria. Sites of international importance for conserving biological diversity**   ***Criteria based on species and ecological communities***  Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.  Criterion 3: A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.  Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.   * ***Specific criteria based on waterbirds***   Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.  Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.   * ***Specific criteria based on fish***   Criterion 7: A wetland should be considered internationally important if it supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity.  Criterion 8: A wetland should be considered internationally important if it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.   * ***Specific criteria based on other taxa***   Criterion 9: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species. | **1-3** |
| 1. **Wetlands have been mapped in some areas of Western Australia.**     1. **Provide a map of the wetlands of Western Australia (include geographical coordinates and location of nearest or major town/city to wetland) , and**  * Latitude: 25O76’E * Longitude: 122O80’E * Towns/Cities: Kununurra Broome, Port Hedland, Exmouth, Geraldton, Cervantes, Perth, Mandurah, Kalgoorlie, Darkan, Augusta, Walpole, Albany, Esperance | **1-2** |
| 1. **Provide a map of the Ramsar site that the CWNR is part of (include geographical coordinates and location of nearest town or major town/city).**  * Latitude: 30O32’S to 33O06’S * Longitude: 115O37’E to 115O to 47’E * Town/Cities: Mandurah, Pinjarra, Harvey, Waroona | **1-2** |
| 1. **Analyse some key features of the CWNR (biogeography, physical conditions, hydrological values, wetland type).**  * Mediterranean climate: mild wet winters (average min 9OC in July) and hot dry summers (max average of 30OC in Feb). Average rainfall is 900mm. Subject to coastal winds (12-16km/hr) * Swan Coastal Plain Soils: pale, brown, yellow or red sands grading to loam by 80cm, acid to neutral pH, poor nutrient retention, acidity and aluminium toxicity, water repellence, waterlogging * Shallow (predominantly <2m deep)estuarine basin, waters, saline, brackish and freshwater wetland * 30km long and up to 12km wide * Covers 133sqkm * Volume 150 million m3 * Three rivers flow into the area, artificially connected to the Indian Ocean (tidal fluctuations) and artificial drainage (stormwater etc) | **1-4** |
| 1. **Use a Fishbone Diagram to classify noteworthy biotic factors (flora and fauna) that inhabit the CWNR.**  * Flora – macroalga (*Cladophora, Chaetomorpha, Hinskia*), seagrasses (*Halophila ovalis, Ruppia megacarpa*), saltmarshes/samphire (*Sarcocornia quinqueflora, Halosarcia indica* subspecies *leiostachya*), sedge (*Typha orientalis),* trees (Salt Sheoak - *Casurina obesa,* Saltwater Paperbark – *Melaleuca cutcularis*, Swamp Paperbark *– Melaleuca rhaphiophylla,* Western Australia Christmastree *(Nuytsia floribunda)* * Fauna – Blue Swimmer Crab, Western King Prawn, 20 000 waterbirds (29 under International Migratory Agreements, 32 Australian migratory species listed under the Federation Environmental Biodiversity and Conservation Act 1999, (spoonbills, egrets, ducks, terns, pelicans, cormorants, sandpipers, stints) fish, aquatic invertebrates, Rare microbial community (cyanobacterium) quenda | **1-6** |
| 1. **Describe if the site has any social and/ or cultural values.**  * Commercial fishing – over $1 million annually * Farming * Recreation – bushwalking, birdwatching, camping, 4W driving, fishing, crabbing, boating, swimming * Tourism – over $150 million annually Crab Festival * Cultural and spiritual – Nyoongar people (Pinjarup country) ‘Waugal” is the creative and life-giving being associated with all freshwater sources, surface and ground. 27 specific sites of significances * Biodiversity hotspot * Pollution control (the basin acts as a nutrient sink) | **1-4** |
| 1. **Analyse how the current land and water use activities within the Ramsar site and surrounding catchment are affecting the CWNR ecological character.**  * Land and water use activities indicated in Q8. Need to also include: housing * Overfishing has lead to introduction of licences * Erosion of the shoreline due to boating and vehicles * Large nutrient loads (Nitrogen and phosphorous) * Algal blooms of toxic cyanobacteria (*Nodularia)* * Dawesville Channel has increased connection to the marine environment * Introduced animals * Disturbance of waterbirds at vulnerable stages of their lifecycle. * Wateruse and groundwater extraction * Clearing of native vegetation * Disturbance of acid sulphate soils * Scientific research | **1-6** |
| **Total** | **/ 30** |