

## CONS7008 Assignment: Scientific webpage to inform National Park management (30%)

**Set:** 5<sup>th</sup> October 2023

**Due:** 9<sup>th</sup> November 2022, 14:00

**Aims of the assessment:** Your task is to create a scientific webpage (in R Markdown) that is equal measures informative, engaging and accessible to any intelligent non-scientist. The aim of the webpage is to present an analysis of previously collected data that leads to **clear management guidelines for how the QLD National Parks Service should manage National Parks in the Wet Tropics Bioregion.** The analysis should be part of a story, starting with some brief (researched!) background information, photos, other images (as you like, be creative!), research questions, brief description of analytical methods, results...and importantly, management recommendations! These recommendations should follow logically from your statistical inferences (i.e. they should be informed by EVIDENCE!).

**Background:** It might surprise you, but government agencies often collect data without having clear questions, and thus no clear plan of how they will extract the information they need from the data. In this scenario, QLD National Parks Service approach you (because you are a well-respected ecologist, statistician and science communicator!!!), to undertake contract research for them. They want advice on how to manage threats to native amphibian species in their National Park estate. Specifically, they provide data on the incidence of Chytrid fungus in three species of amphibian, each sampled in creeks across 15 National Parks in QLD's Wet Tropics Bioregion. The only background they provide is a summary of the Chytrid fungus problem published by the Australian Government (refer to "Chytrid\_Aus\_Gov\_Summary.pdf"). They also provide two csv files and an associated Readme (metadata) file.

**Marking criteria:** Your webpage will be made in R Markdown and should include R code for all data wrangling, analyses and datavis. Marks will be allocated as follows:

- The webpage tells a compelling, well-researched (five references minimum) and coherent story (15% for narrative)
- It includes clear descriptions of / justifications for the chosen statistical models and variables included therein (this need only be brief) (10%)
- It includes robust statistical analyses (including diagnostic checks for statistical models, but these can be hidden so that they don't interrupt the narrative of the web page) (20%)
- It presents beautiful (and RELEVANT) results figures coded completely in R (not inserted as images!!!) (20%)
- It describes results in clear terms, referring to key figures or tables, and explains what they mean in terms of the ecology and management of native amphibian populations (10%)
- It culminates in **evidence-based** management recommendations (15%)
- It is visually engaging, easy to follow and original (10%)

**Other requirements and advice:** You MUST read in the "raw" csv files provided by National Parks and undertake all data wrangling and analyses in the R Markdown document. This might seem daunting, but we all learn by first adapting code from similar examples. You

can adapt R code from different parts of the CONS7008 prac manual, and if you feel brave, integrate your original R code and/or code from elsewhere in a meaningful/useful way. The pracs have covered almost everything you need for this analysis (see coding tips below).

In terms of design, you do not have to follow any rigid, predetermined layout but you must present a clear narrative. In other words, the webpage should be logical and easy to follow but there is a lot of room to express creativity!

**Coding tips:** Once you have read in the data files, if you want to join the Chytrid data (225 rows) with the NP data (15 rows), look at the `merge()` function in base R or `left_join()` in the Tidyverse. If you want to make pretty table, look into the `kable()` function within the Tidyverse. For statistical decision making, see “Dwyer’s Decision Trees”. And remember, Google is your friend! Dwyer uses it during most of his R sessions.

**Strategic tips:** It will probably be most efficient to first read the background document, then the readme file (to see descriptions of each variable) and then start to explore and visualise the data in R. From here you can formulate research questions and map out the analyses that you will do. This might seem a little back-to-front (to explore data before the questions are clear), but it is **important that you pose questions that can be answered with the data provided.**

**Logistical tips:** MAKE AN R PROJECT, and explore the data using a basic R script first. Once you have sections of code that do what you want, you can copy them into the relevant part of the R Markdown file. Similarly, it may be easiest to draft the text parts in MS Word and copy these into the R Markdown file later (but be aware that formatting will be lost when you paste this into R Markdown). Formatting in R Markdown is done with coding but don’t worry, it’s pretty easy and we will show you this (and more) during the final R prac.

**Submission:** Submit via Turn-it-in BEFORE 2pm on **9<sup>th</sup> November 2022**. Please submit a **ZIPPED R PROJECT FOLDER**. When marking it **I should be able to:**

- (1) download it
- (2) unzip the folder
- (3) open the .Rproj file in RStudio
- (4) Open the Rmd script
- (5) knit the HTML