1. **Career goals**

In 10 years, my ideal job would be: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and my research interests, although they are still developing, would be: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Alternative career paths that I would like to keep open as possibilities, include: \_\_\_\_\_\_\_\_\_\_\_\_\_.

1. **Keep steps towards career goals**
   1. To work towards my ideal job, I want my Ph.D. research to make me competitive for international postdoctoral fellowships, such as:
      1. NZ Mana Tūāpapa Future Leader Fellowship (the replacement for the Rutherford postdoc)
      2. The Australian DECRA postdoctoral fellowship
      3. Marie Curie (France)
      4. Humboldt (Germany)
      5. NSF postdoc (USA)
   2. **Get experience publishing – have each Ph.D. chapter published or submitted.**
   3. I would also like to develop my abilities in:
      1. Teaching
      2. Networking
      3. Scientific research presentation
   4. **Skills I need to develop include:**

[The below are quite generic. Basically you are just saying phylogenetics & biogeography; 3 & 4 are a bit more specific. But, you will want to develop these more.]

1. **Potential PhD Chapters**

1. Testing models of carnivorous plant trap evolution through statistical model comparison

2. Carnivorous Plant Biogeography: When and where did the species with hypothesized transitional traps live?

3. Phylodynamics of Carnivorous Plant Diversification: Why are *Utricularia*, *Drosera*, and *Nepenthes* speciose, and *Dionaea*, *Aldrovanda*, and *Cephalotus* not? (speciation/ extinction linked to traits/ regions)

4. Carnivorous Plant Genomics: What hypotheses about trap evolution can be tested with available/upcoming whole genomes of carnivorous plants (Stretch goal; needs more work; discuss with Tanya Renner. Possible a postdoc grant application.).

5. Carnivorous Plant Distribution Modelling: Can the future of carnivorous plants under climate change be predicted? (Stretch goal; needs more work; requires careful thinking/literature research before launching into it. Possibly a postdoc grant application.)

1. **Goals for Provisional Year Review (PYR)**
2. Publishing the paper: Evolution of Carnivorous Plant Traps (the project we did in Honours year, I will run the code again, review papers and publish)
   1. Learn GitHub and construct a well-documented archive for the data and code on the carnivorous plant trap evolution paper
   2. If possible, give a talk on this paper, e.g. at NZ Phylogenomics 20205
3. Provide, to Nick, worked-out examples of key techniques to be used in the thesis, with illustrations generated by R code, covering key techniques to be used, with short written explanations. Draft list of items to train on is here: Bioinformatics Bootcamp - https://docs.google.com/spreadsheets/d/18Gj\_u05E-Fn\_l0OTq2n7s3r1YpDyEmn60Kh4dmlzW7g/edit?usp=sharing
   1. Likelihood, log-likelihood, Maximum likelihood, likelihood ratio test, and AIC/AICc/BIC and statistical model comparison with the same, Markov models for discrete characters, SSE models, biogeography models, comparison of log-likelihood and RSS (residual sum of squares) in linear regression, explanation of linear regression as an ML technique
   2. Phylogeny objects in R, and how to manipulate them
   3. Perform basic bioinformatics tasks in R and command line terminal (relabelling sequences in FASTA files, generating alignments, trimming alignments, etc…)
   4. Use of Iqtree and Beast2 on a basic sequence dataset
   5. Explanation and use of different kinds of graphs: scatter plots, histograms, bar charts, box plots, violin plots, PCA or NMMDS plots (R introductory workshop on Oct/2024?)
4. Assembly of a geography dataset for carnivorous plant biogeography
5. Full thesis proposal by 1st June 2025:
   1. Title
   2. Abstract
   3. Background and Rationale
   4. Research Aims and Objectives
   5. Research Design and Methodology
   6. Timetable?
   7. Bibliography?
6. **Trainings/ Meetings. Ranking by importance**

**Meetings:**

1. SBS Research and Teaching Showcase (2 mins intro + one slide) in November 2024?
2. NZ phylogenomics (Kaikoura 2025, 11th Feb 10 am -14th Feb 12 pm 2025)
3. Australasian Evolution Meeting (<https://ausevo.com/registration/> , Wednesday 4th – Friday 6th December 2024 Perth)
4. Evolution 2025 in Athens, Georgia, USA (ASN/SSB/SSE joint meeting) June 20-24
5. **24th Evolutionary Biology Meeting at Marseilles: September 16- 19 2025  (social events 20-21)**

**Trainings:**

1. Key R techniques, Beast 2, IQtree, and GitHub use. BioGeoBEARS and PhyBEARS/Julia
   1. How to make a simple R package
   2. Installing scientific software / freewar
2. Communication: More confidence when talking people, and be able to give explanations/ rebut objections
   1. Regularly attend PhyloBioGeo lab meeting (paper discussion + give some talks)
   2. Alexei’s meetings, 10am Mondays
   3. Local + International meetings
3. Networking (through meetings)
   1. Join listservs/email lists (google these; I’m not sure if the societies have mailing lists:
      1. Evoldir
      2. Society of Systematic Biology (SSB)
      3. Society for the Study of Evolution (SSE)
      4. International Biogeography Society (IBS)
   2. Give posters / talks
   3. Attend socials at meetings, share housing/airbnbs