Report Writing

BSC100

Writing reports is telling the story of your experiment

Story plot/theme – **research aim/question**

SCIENTIFIC METHOD

Observation → I wonder if…

Hypothesis (if…then…) or Aim

Experiment

Findings

Figure out what these mean

Do they support the hypothesis?

YES → Theory

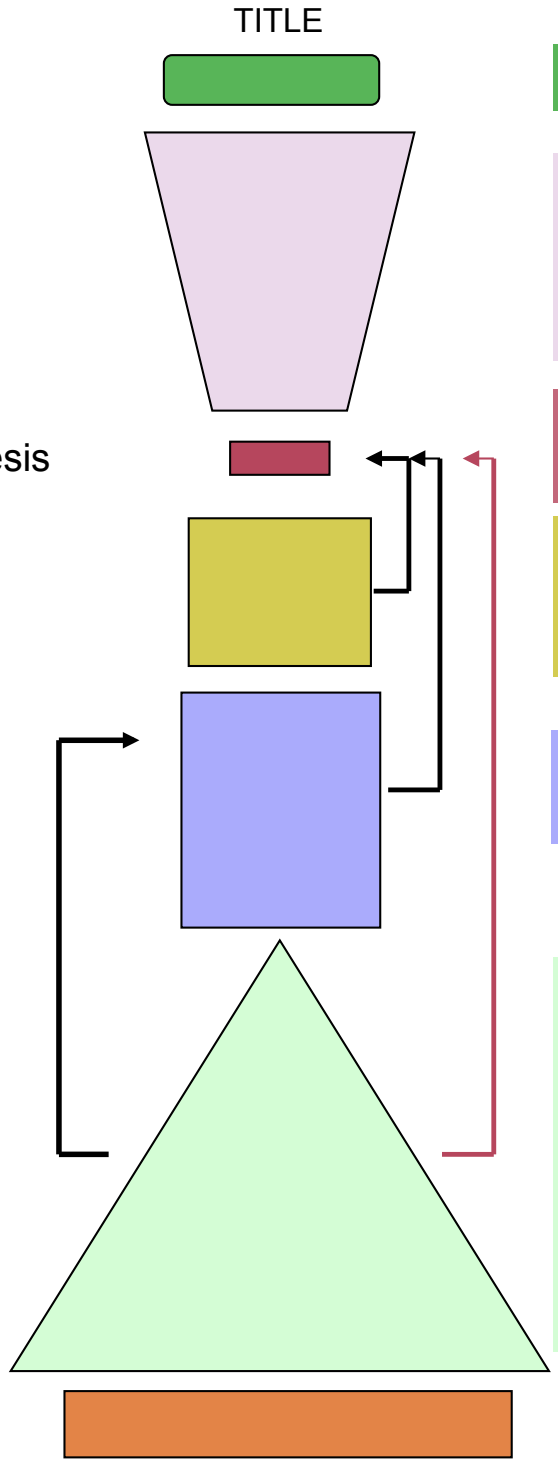
NO → WHY?

SCIENTIFIC METHOD

Hypothesis
(if…then…) or
Aim

What we do		What we write
Experiment	→	Methods
Findings	→	Results
Figure out what these mean	→	Discussion

SECTIONS OF A REPORT



Summarizes the report

- Introduces the topic
- Provides a literature review
- Provides rational of why you need to do this study

KEY to your study
(i.e. this is what this is all about)

List the methods/experiments that you carried out to find an answer to your study question

Describes the results that you obtained from your experiments/study

Critical Thinking section of your report
- Discusses possible reasons for your results
- Compares and contrasts your results to those obtained in other studies
- Reflects on the implications of these findings (i.e. where do my findings fit into the bigger picture?)
- Identifies areas for further research

List of references cited in your report
Preferably > 10

Sections of a report	Order in which you write them
Title	6
Abstract	8
Introduction	5
Methods	1
Results	2
Discussion	3
(Conclusions – optional)	4
References	7

Before you start writing your
Methods section,
write out your
aim or hypothesis

Methods

- ✓ Easiest & most straight forward
- ✓ Include all Methods
- ✓ Chronological Order
- ✓ Use subheadings if necessary

Methods – DO & DO NOTs

DO	DO NOT
Write methods in whole sentences and paragraphs	Write it in dot points
Write it in past tense	Write it in present of future tense
Include everything that you did	Forget parts of your methods
	Write cooking recipes

Methods – DO & DO NOTs

You then go and fill a bucket with water.

A bucket was filled with 2L of water.

We then put the candle on the table and lit it.

A candle was placed on the table and lit with a lighter.

Results

✓DO NOT INCLUDE RAW DATA

- ✓Convert raw data into results
- ✓All results
- ✓Graphs (Figure)
- ✓Tables

Rules for Graphs

- Graphs are called “Figures”
- All axes (x and y axis) labelled
- Figure label and caption BELOW figure

Rules for Graphs

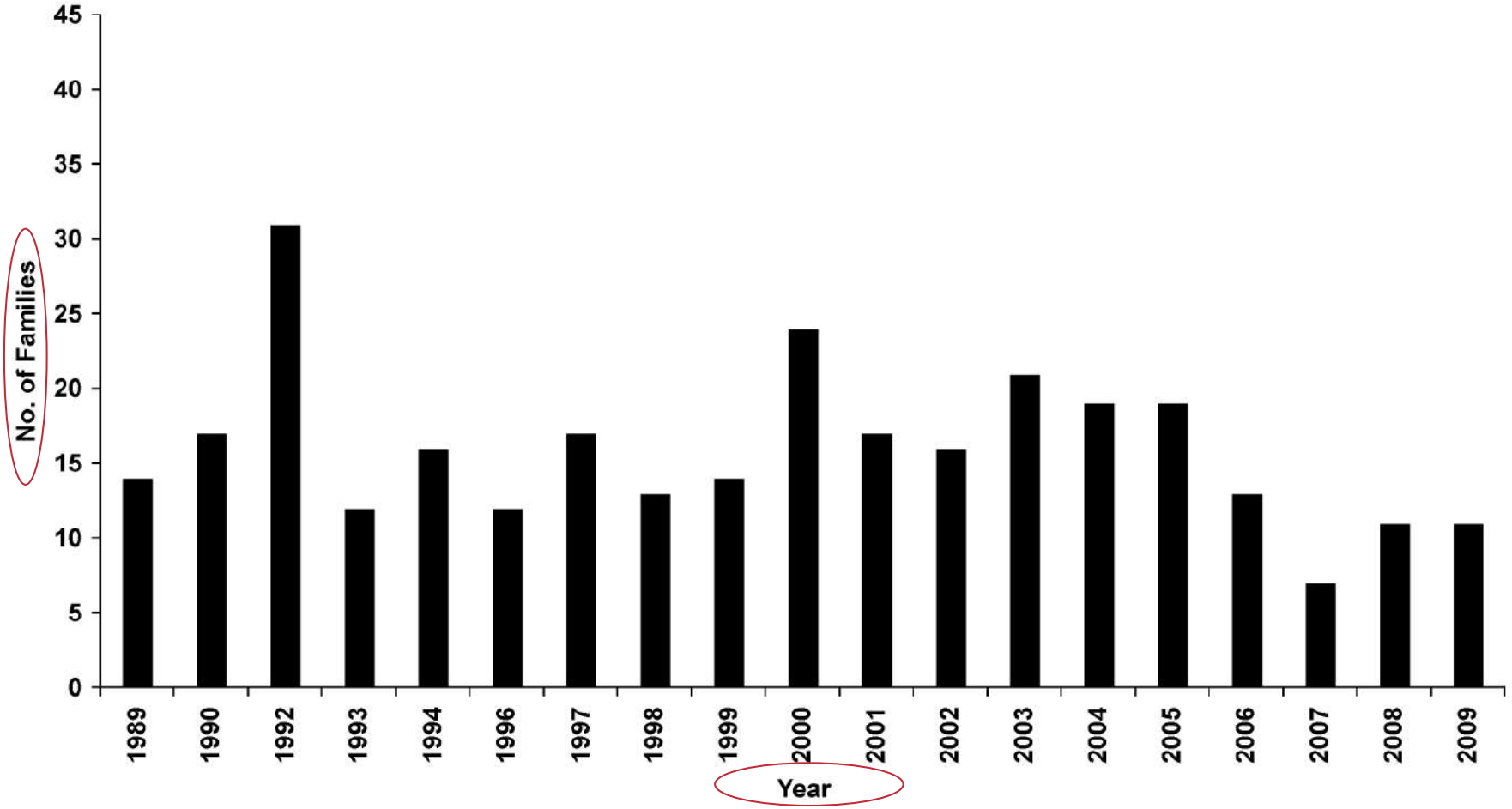


Figure 1. Changes in the number of macroinvertebrate families recorded at Yangebup Lake, WA, during 1989-2009.

Rules for Tables

Table 1. Annual changes in Signal scores at Christmas Tree Creek

		CT CK 1	CT CK 2	CT CK 3	CT CK 4	CT CK 5	CT CK 6	MEAN SIGNAL SCORE
Unweighted Signal Scores	**2008**	**4.3**	**2**	**2.8**	**4.6**	**5.3**	**4.8**	**4**
	2009	4.4		4.5	4.7	4.3	3.9	**4.4**

Table caption: ABOVE table

Describe Results

Results

The number of families in Yangebup Lake were low and stable, showing little variation between years. The highest number of families was recorded during 1992 and the lowest in 2007 (Fig. 1).

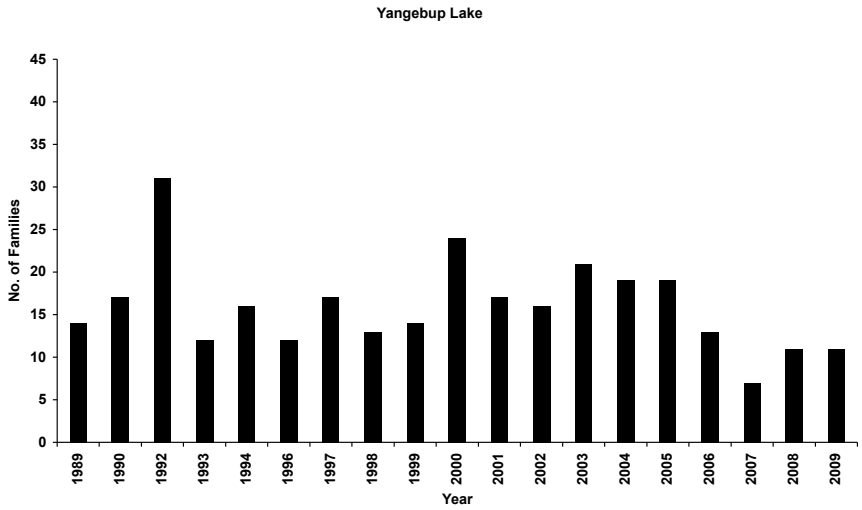


Figure 1. Changes in the number of macroinvertebrate families recorded At Yangebup Lake, WA, during 1989-2009.

✓Do NOT EXPLAIN
your results in this section

Results

This study recorded 10 different taxa, with ants being the most abundant group (Fig. 1).

Description

This study recorded 10 different taxa, with ants being the most abundant group (Fig. 1), because ants occur in large colonies and were therefore caught more easily.

Explanation

4.2. Water Quality

Despite increased rainfall during 2016, the catchment was very dry. Most sites only had very shallow water and slow flow. Water levels at Christmas Tree Ck ranged from 10-50cm, with most sites having water depths of 10-20cm. A depth of 50cm was only recorded at one site (CTK&). Of the three stream systems sampled, the lowest water depths were recorded at Strelley Bk. All sites were slightly acidic when measured in the field. As in previous years, conductivity at all sites was higher than recommended ANZEEC guidelines. The water at most sites was very clear, well below trigger values with the exception of site JB2, where turbidity was more than double the recommended values (Table 8).

Table 8 Physico-chemical variables recorded in situ at Christmas Tree Ck, Strelley Bk and a dam along Christmas Tree Ck in 2015.

	Christmas Tree Ck	Strelley Bk	Jane Bk	Dam	ANZEEC Trigger Value
Depth (cm)	10 – 50	0.5 – 15	10 – 30	50	
pH	6.1 – 6.9	5.8 – 6.2	6 – 6.5	6.2	6.5 Lower limit, 8 Upper limit
Conductivity (µS/cm)	120 – 720	310 – 450	220 – 820	300	120 – 300
Turbidity (NTU)	0.7 – 6.1	1.7 – 5.6	3.7 – 56.4	0.9	10 – 20

Note: ANZECC Trigger values used are for upland rivers in south-west Australia.

Nutrient concentrations were slightly higher than in last year, although not as high as previously recorded in these systems. NOx values exceeded recommended guidelines at most sites, with values at the Dam and SB1 exceeding the trigger values 10-fold and at CTK17 NOx values were 20 times higher than ANZEEC guidelines. It is interesting to note that values at CTK15, a few meters upstream of the Dam were considerably lower than those in the Dam. Total N exceeded guidelines at the dam, CTK17 and SB1, sites that were closest to the Red Hill Management facility. High total Phosphorous levels were only recorded at site SB4.

Of the dissolved metals analysed, levels exceeding guidelines were observed for Aluminium (JB2, JB4), Zinc (CTK17), and Iron (CTK15, Dam, CTK2, CTK3, CTK4, CTK6, CTK7, CTK9, CTK12b, JB2, JB3, JB4) (Table 9).

A total of 3064 animals were collected in 2016, of those 1411 were collected at Christmas Tree Ck, 786 in Strelley Bk, 442 in the dam and 442 in Jane Bk. Generally abundance was similar to previous years, with only a few key taxa reaching abundances exceeding 100 at any given site. The most abundant group were the Paramelitidae (blind amphipods) which were found in high numbers (total 826) in both Christmas Tree Ck and Strelley Bk. Cyprididae ostracods (612) were the second most abundant group. These were very abundant at Strelley Bk. The third most abundant group were Flatworms (486), which were common in Christmas Tree Ck (Table 16, 17; Figure 5). Highest abundance was recorded at the dam followed by CTK5 and SB4 (Figure 6).

Figure 5 A blind amphipod (left) and a flatworm (right), October 2016.

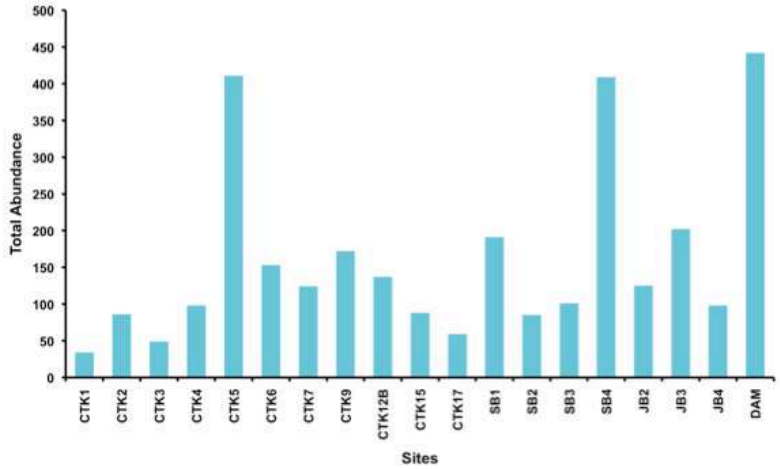


Figure 6 Total abundances recorded at sites along Christmas Tree Ck, Strelley Bk and Jane Bk October 2016.

Discussion

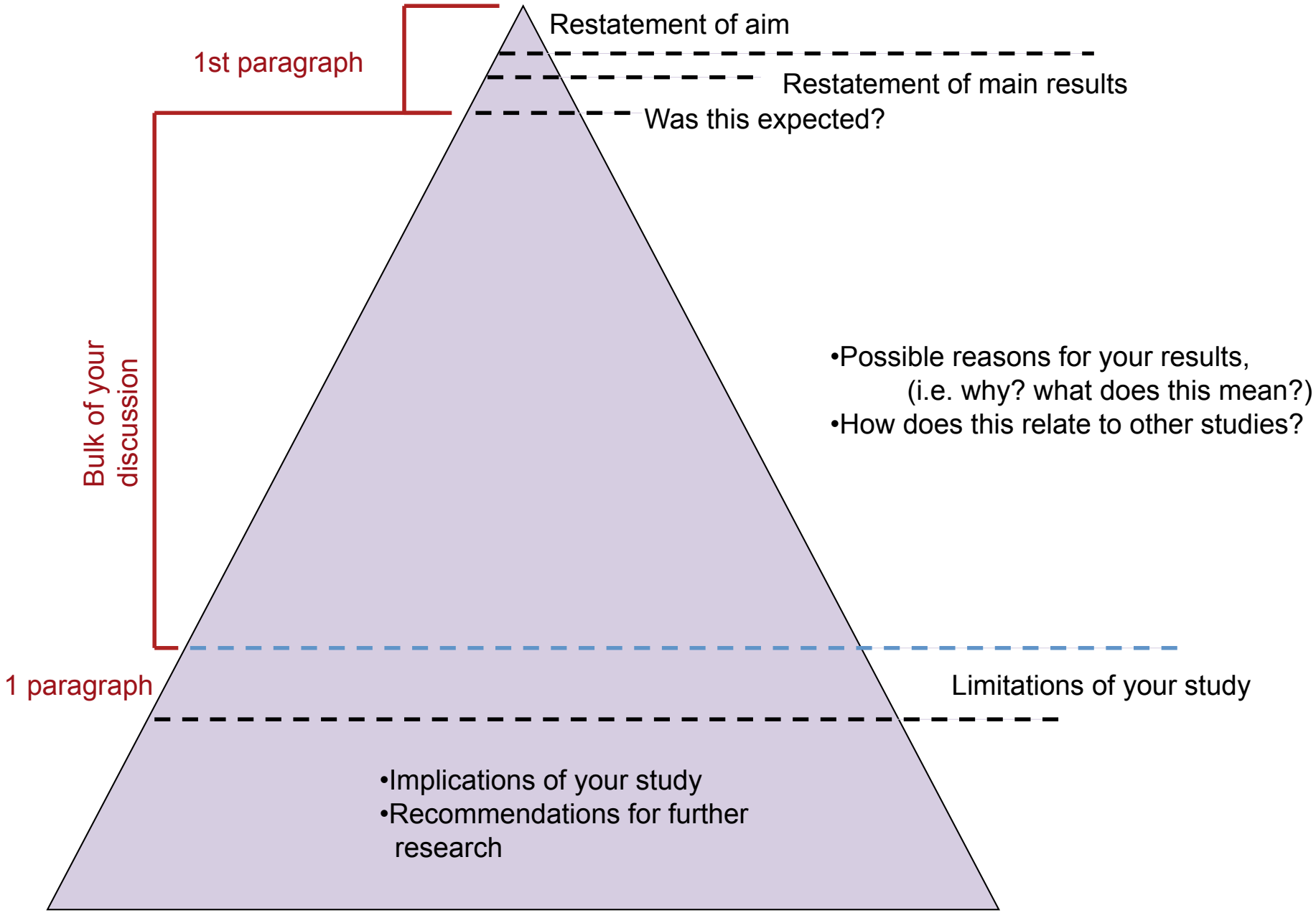
- Making sense of your story and your results
- Section with most marks allocated
- Section where you show your critical thinking skills
- Section with lots of references

Discussion - sequence of information

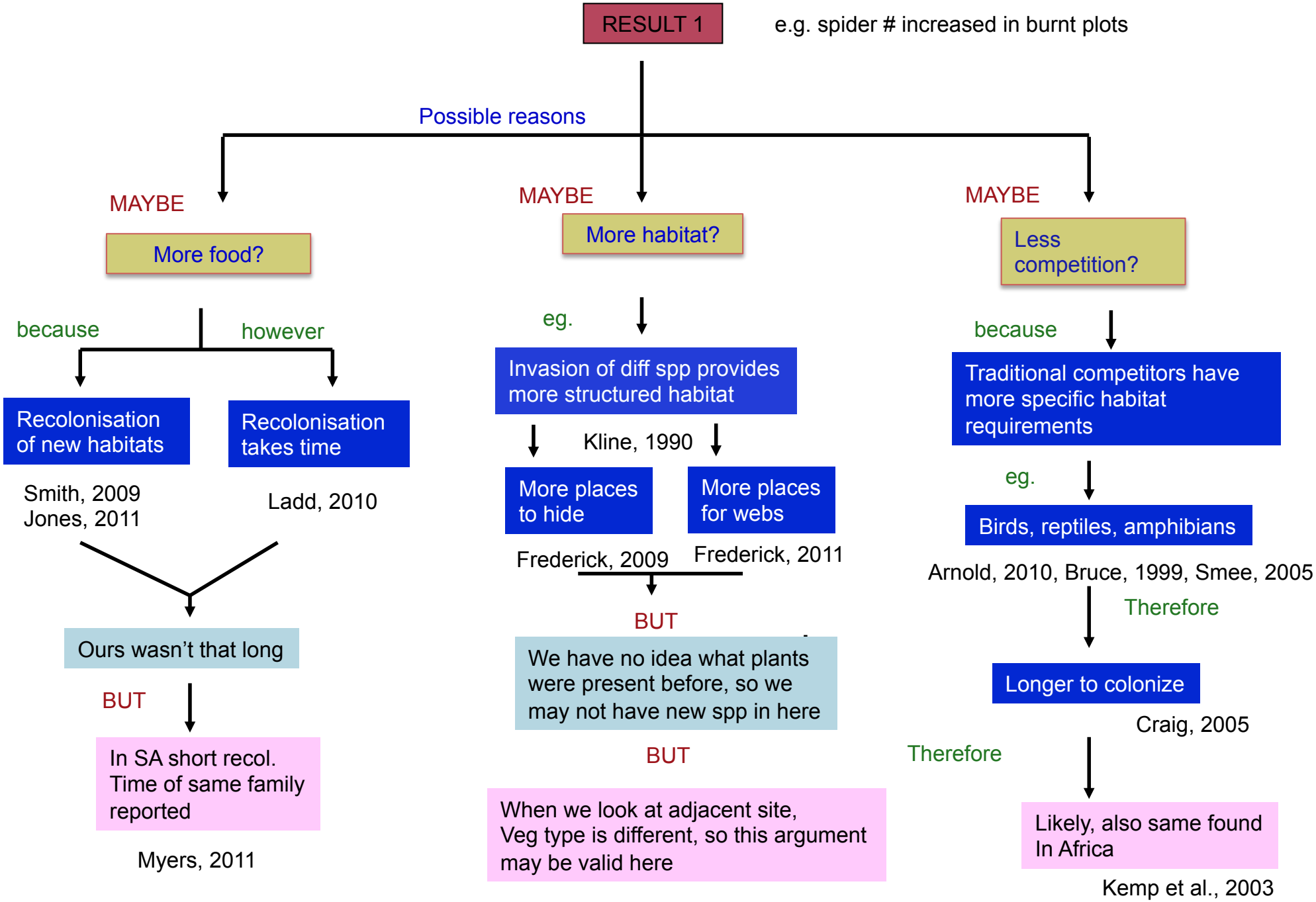
- ✓ Restatement of aim
- ✓ Restatement of main results
- ✓ Were these results expected? Yes, no, why?
- ✓ Compare your results to those of other studies
- ✓ Discuss possible reasons for your results
- ✓ Support your arguments
- ✓ Limitations of the study
- ✓ Implications of study
- ✓ Future research

CRITICAL THINKING

Discussion at a glance

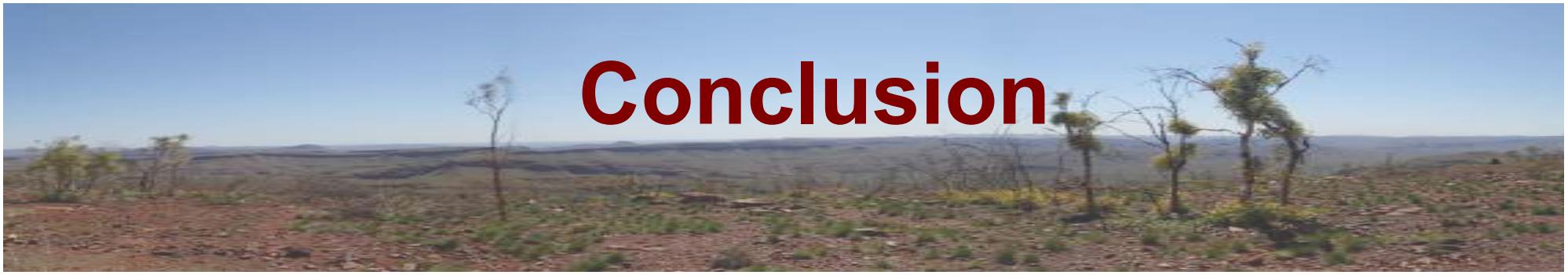


Discussing Results



Repeat this process for each one of your Results!

Sorry, you'll have to do a lot of thinking and reading!



Conclusion

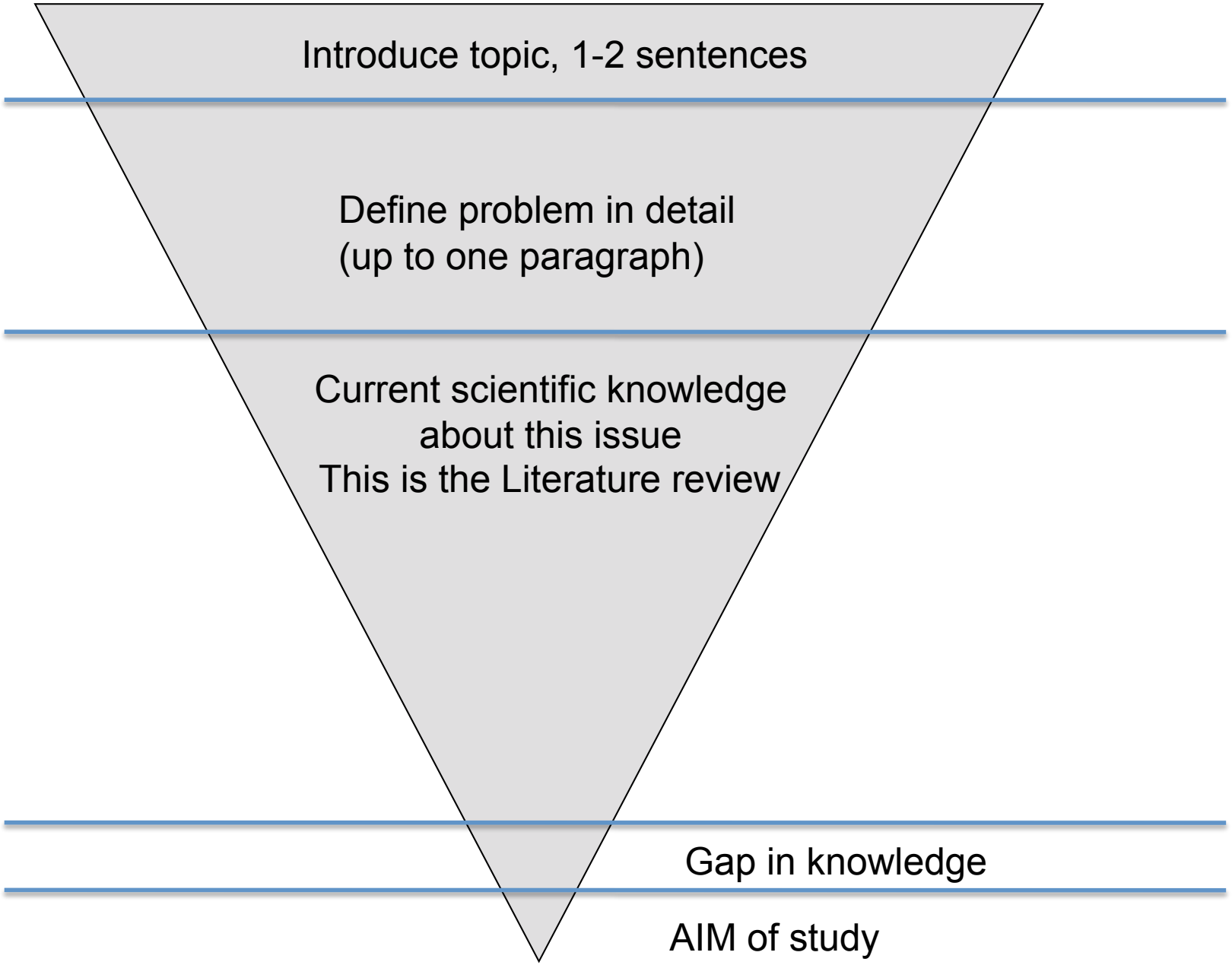
- ✓ Optional
- ✓ Summary of discussion
- ✓ Main focus on implications & recommendations

Introduction

This is the correct order of the information

- ✓ Introducing the topic
  (set the scene, context)
- ✓ Define problem in more detail
- ✓ Present current scientific knowledge
  on this topic (i.e. literature review)
- ✓ Identify a gap in the current knowledge
- ✓ AIM of your study

Introduction at a glance



Introduction - Example

A popular image of a pirate is that of a one legged, one eyed, bearded man with a colourful parrot on his shoulder. Parrots have in fact been the pet of choice for captains as they symbolised their status. However, parrot ownership does have health implications. Respiratory illness such as psittacosis, a disease caused by the bacterium *Chlamydophila psittaci* can lead to death in humans (Smith, 2017). More recently, the bird flu has been found to also affect pet parrots (Brown, 2016). While the effects of these diseases on mainland pet parrot populations is known, the same is not true for those pets kept at sea. Similarly, it is unclear how these diseases, if present, would affect pirates. This study therefore examined the incidence of avian transmitted diseases on pirates.

Obviously yours will be much longer than this one (at least 4-5 paragraphs long!)

Title

✓ Descriptive

✓ Up to 10 words

References

- ✓Full reference list
- ✓Include every reference cited in text
- ✓References in correct format
- ✓References in alphabetical order

Abstract

Summary of your report

Length: ✓ 5-10% of total word count

Order: ✓ Introductory sentences (1-2)

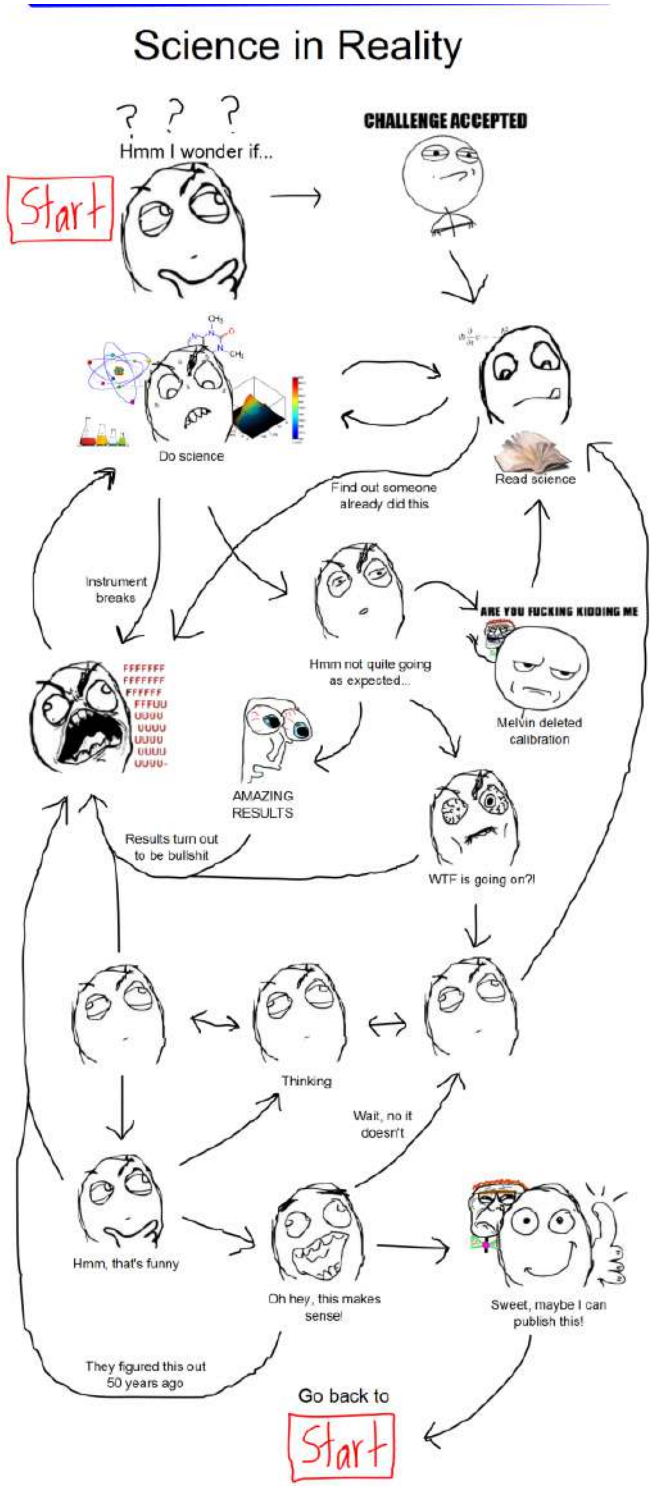
✓ What you did- Aim (1-2)

✓ How you did it - Method (2-3)

✓ Main results (2-3)

✓ Conclusion/Implication (2-3)

http://electroncafe.wordpress.com/2011/05/04/scientific-process-rage/



Writing Reports is about lots of
Hard work
Thinking
Researching
Thinking
And more thinking…

But it is so much fun