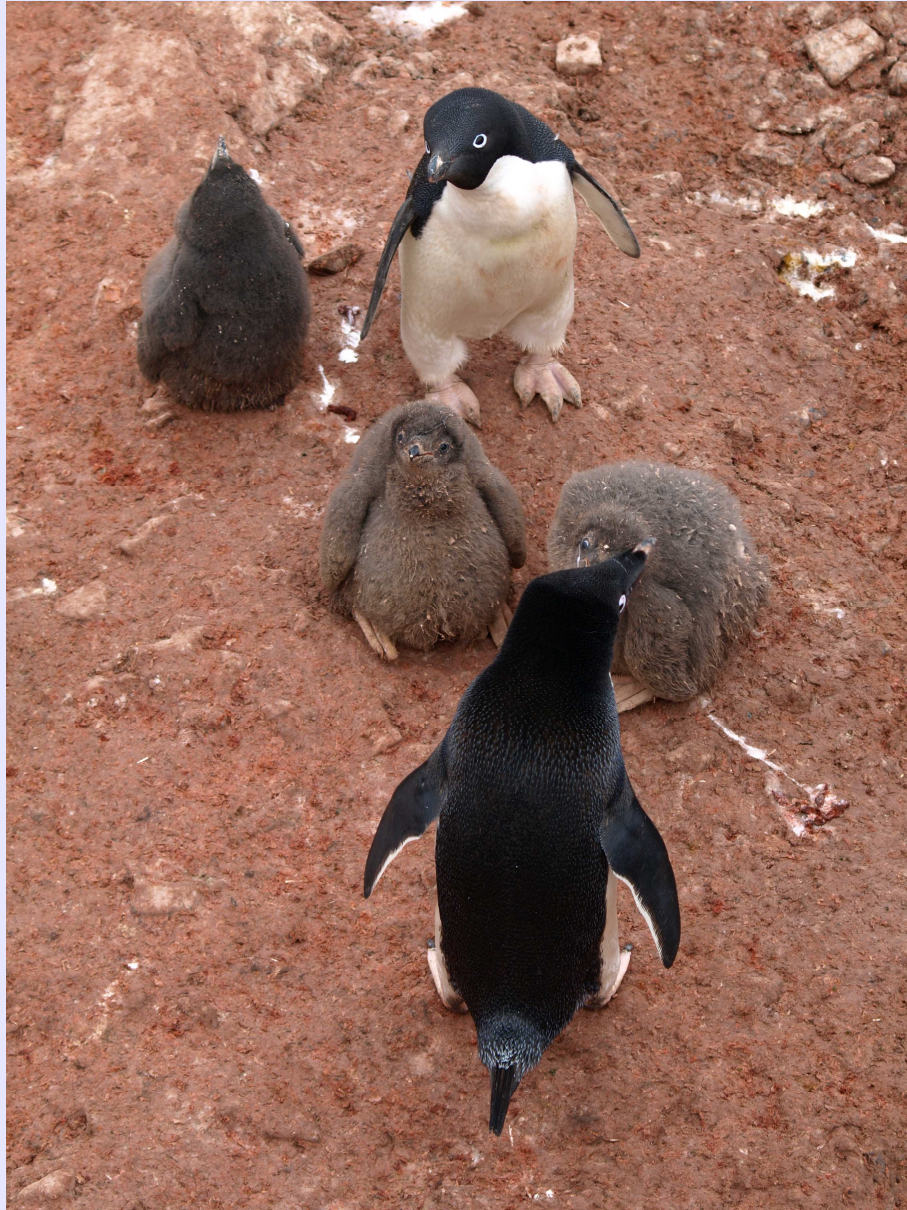


The state of the art of DNA based diet analysis



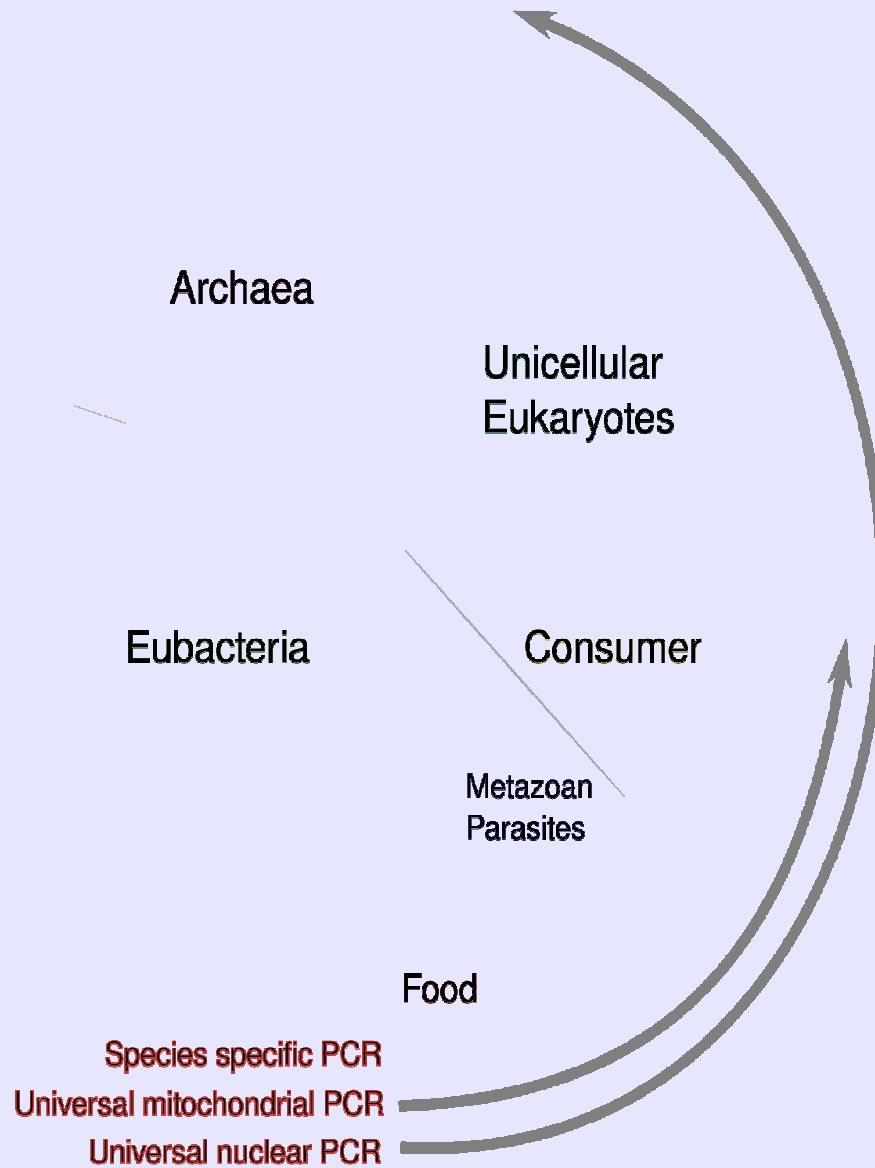
Simon Jarman,
BruceDeagle,
RogerKirkwood,
Steve Nicol,
Nick Gales

Australian Antarctic Division,
Kingston, TAS

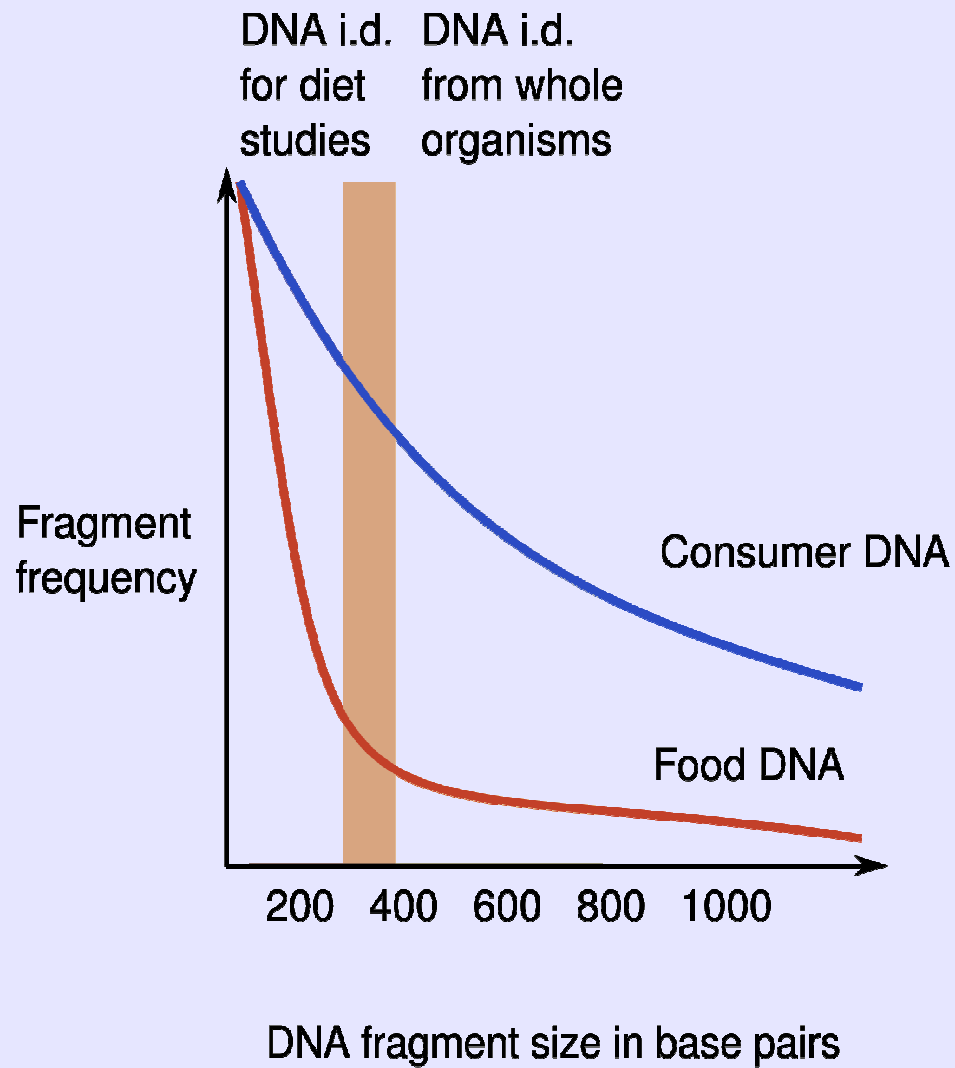
Two types of dietary question



- Does consumer X eat food species Y?
- What does consumer X eat?

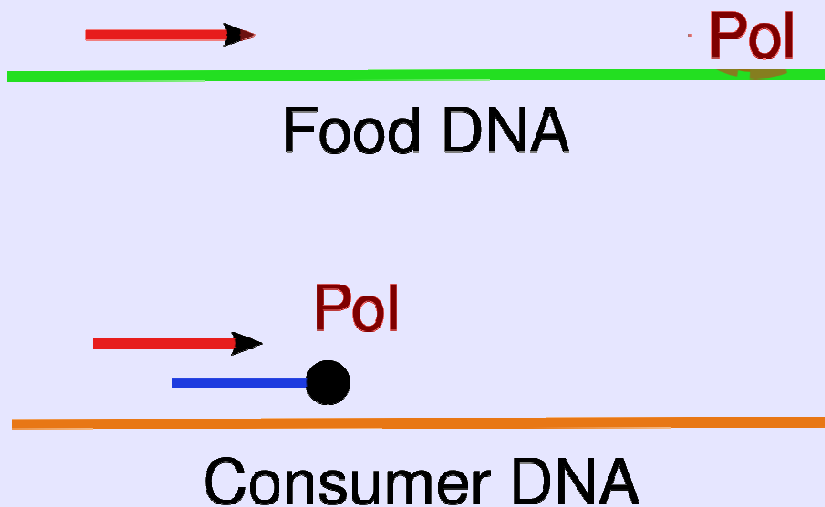


Total DNA in dietary samples

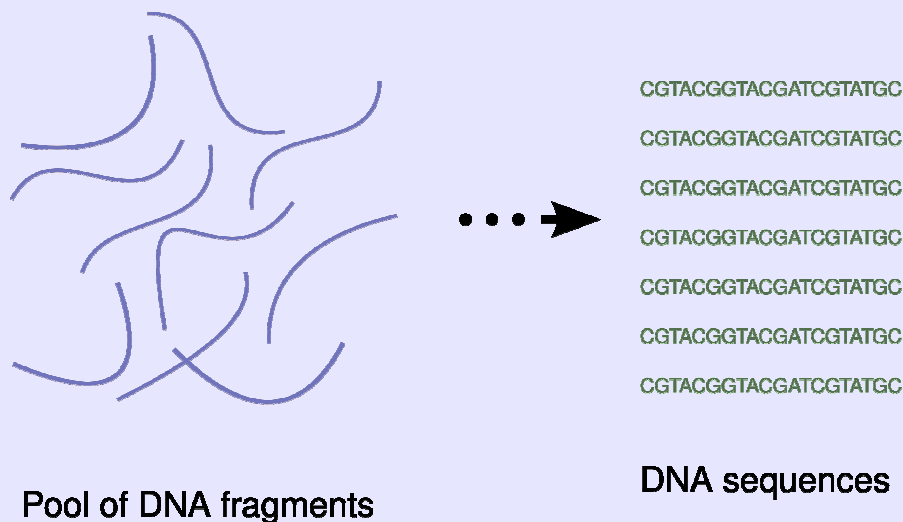


Food DNA is degraded

Two new technologies

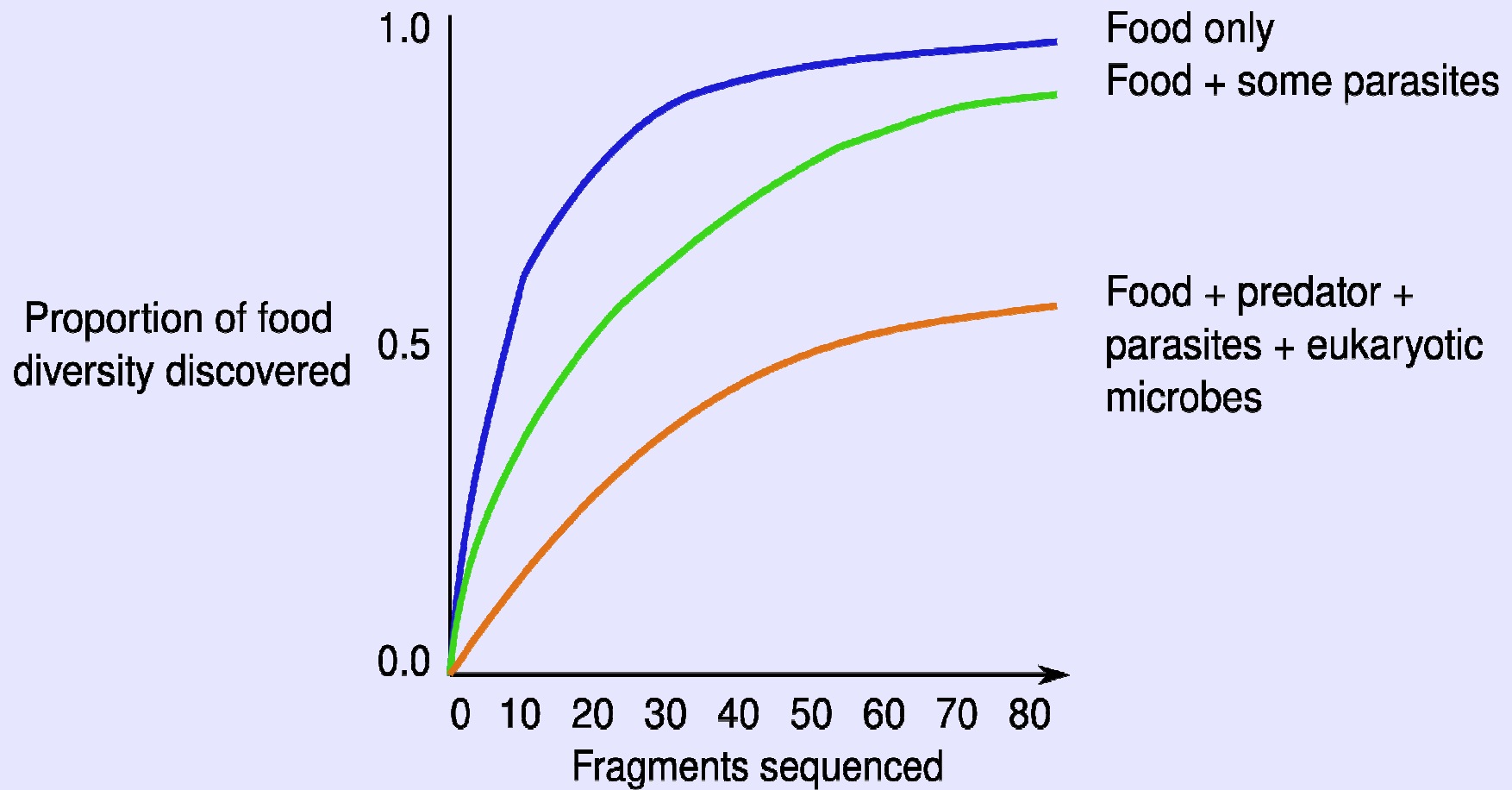


- Efficient blocking primers for suppressing PCR amplification of consumer DNA
- Next generation DNA sequencing



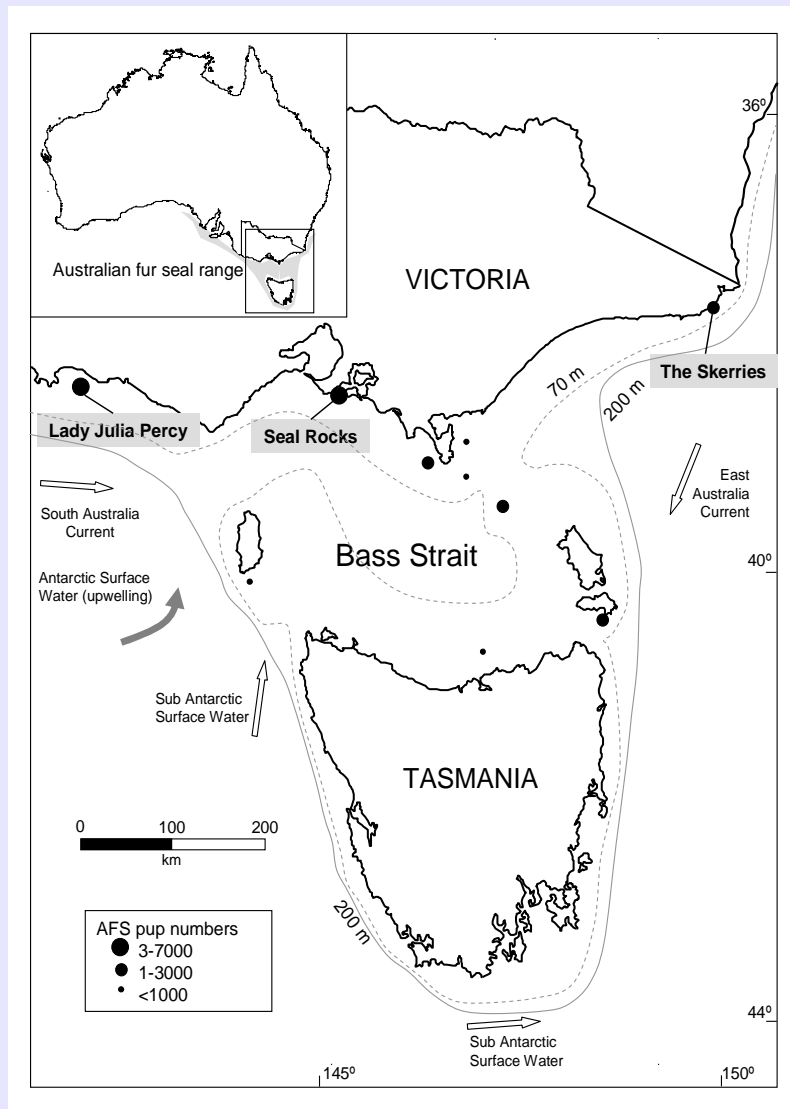
Pool of DNA fragments

DNA sequences



Coverage of diversity present

Australian fur seal diet from faecal DNA



- 90 scat samples collected from each location
- PCR products from four DNA regions pooled for each location
- 17480 sequences analysed (~ 5800 per location)

Results and conclusions

- DNA analysis correlated well with hard part analysis for major fish species, but DNA detected more rare species.
- Taxa identified included:
 - 55 fish to species or generic level
 - Squid, octopus and cuttlefish at family level
 - Crustaceans, nematodes, annelids, tunicates at ordinal or phyletic level
- Major dietary differences between locations identified.
- Answered otherwise unanswerable questions on soft bodied prey.
- Results are quantitative with correction.
- Total cost of laboratory analysis ~ \$7,500, labour ~ \$30,000.