



## Southern Sweetlips: extra slides



*Mark Bravington, CSIRO: June 2021*



# Dealing with length in age-based CKMR

*Age-based* pop dyn    much simpler than joint-L-A

but *length* drives fec and sel

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- extra easy if  $CV(L@A)$  is constant: indiv Linf, indiv vonB
- not hard anyway

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*If sel-within-age strong enough to affect Z-within-age... yuk!*

# Tedia #1: the plus-group

Assume no growth & equal  $Z$  from  $A_{+}-1$  onwards

**Problem:** back-projecting age/size for POP comps...

Can't ignore plus-group for TRO

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**My preferred solution:**

1. Keep track of  $\bar{A}_{+}$  via 
$$\bar{A}_{+,t+1} = \frac{N_{+t} (\bar{A}_{+,t} + 1) + N_{A_{+}-1,t} A_{+}}{N_{+} + N_{A_{+}-1,t}}$$

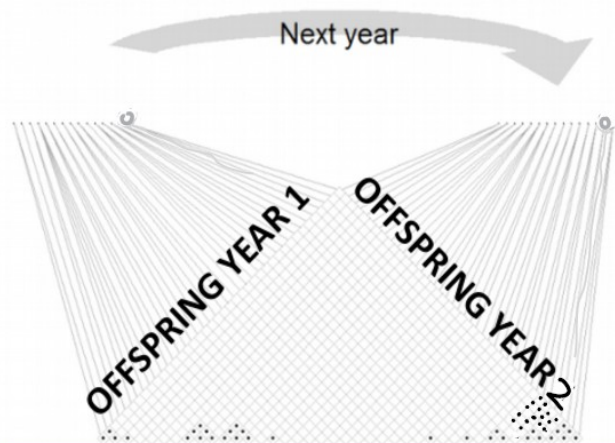
2. Assume geometric distro of age *within* plus-group, matching  $\bar{A}_{+}$

3. Back-project from (~5) quantiles of that distro

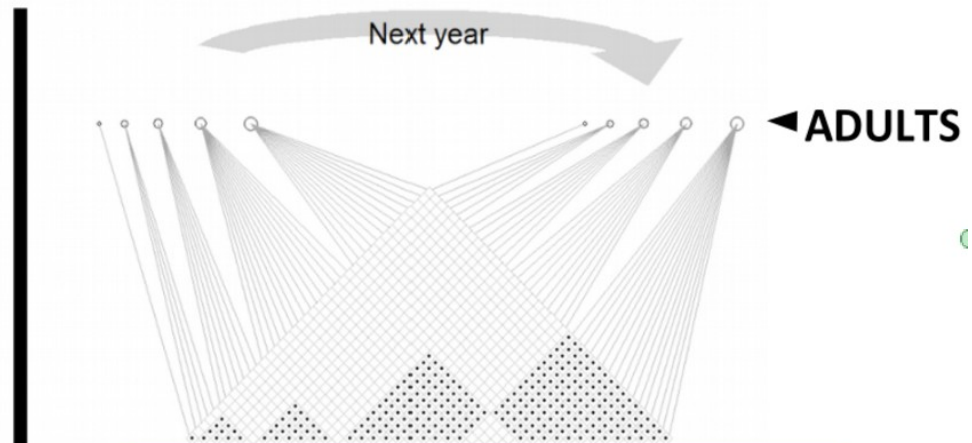
# HSPs & POPs: filling the holes

These two populations have *same* TRO... 100 offspring each per year  
POP rates given adult size:

$\sim 1/100$  for *smallest*;  $\sim 8/100$  for *mid-size*;



**Scenario 1:** lots of *young* adults



**Scenario 2:** fewer adults, but older

... but *very different* HSP rates !

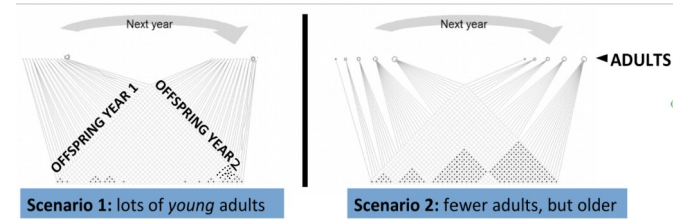
On RHS, #HSP => “average adult must be largeish”

... thx2 *quadratic* fec term in HSPs

# Nequiv again

All POP probs are basically of this form:

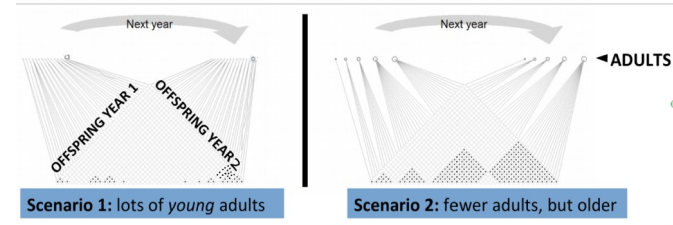
A-specific stuff  
----- \* (time-gap stuff)  
TRO of J-likes



*and HSP probs are like  
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*Units of TRO are up to us!*

So, after allowing for time-gap stuff the *observed* rate for that AJ-category tells us:

numerical abundance Nequiv of parents of *all* J-likes, *if* all parents A-like

HSPs: Nequiv of J-like's parents if all were *average parents*;

NB *average parent*  $\neq$  *average adult* except in "mammals"