In the population, males can invest 't' portion of their fitness f_m. $(1-t)f_m$ is the fitness left for their physiological activities.

In the population, females are choosy. Choosiness does not affect the female's fitness f_f. But, after every mating event, a female loses a part of her fitness. Let us assume that it is Δx.

Why this? Is this because of the female's choosiness? It's not clear.

Steps:

1. Identify a male(i) based on his investment (t).
2. Choose a random number, r_1.
   r1*max. fitness= $f_{threshold}$ → According to this logic, the threshold could be really low and fluctuating too.
   If the fitness of the i^{th} male is less than $f_{threshold}$, choose a new male.
3. Identify a female(j) based on her choosiness(p). → How does this identification work? Numerically, I mean.
4. Choose a random number r_2.
   r2*max. fitness = $f_{threshold2}$ & $f_{threshold2} >= \Delta x$.
   If the fitness of the j^{th} female is less than $f_{threshold2}$, choose a new female.

The rationale for this variable and fluctuating thresholds is not clear.

After a successful mating event, fitness of the female that mated = $f_f - \Delta x$

The male's fitness reduces because of his investment in making an ornament, while the female's fitness reduces because she participates in a mating event.

Not sure about this. The gestation period for birds is pretty small (~ week).

Pool of males (f_i, t_i)

Pool of females (f_j, p_j)

$\downarrow$

- pay cost ∵ of ↑ predation ∵ of ornament
- This predation rate dependent on $(f_i t_i)$.
- Likelihood of survival more if non-ornament fitness is high. $f_i(1-t_i)$.

⇒ Prob. that i^{th} male makes it to sexual maturity $= \dfrac{f_i t_i}{f_i(1-t_i)} = \dfrac{t_i}{(1-t_i)}$

$\downarrow$

Get pool of males which make it to sexual maturity.

$\downarrow$

- Finding mating partner needs both to move and expend energy. Therefore, the chance that i^{th} male and j^{th} female see each other for mating

$$P(\text{access of } i^{th} \text{ male \& } j^{th} \text{ female}) = \underbrace{[(1-t_i)f_i]}_{\text{non-ornament fitness}}\ \underbrace{[f_j]}_{\text{female fitness}}$$

- Now this j^{th} female will exhibit choosiness to mate/not mate w/ this male.

The prob. that i^{th} male and j^{th} female selected from the above step actually mate

$$= \cancel{\exp} = \frac{\exp(\alpha p_j t_i f_i)}{\sum_{i=1}^{\text{males}} \exp(\alpha p_j t_i f_i)}$$

$\Downarrow$

Each successful mating gives rise to new offspring, as we've been doing earlier.