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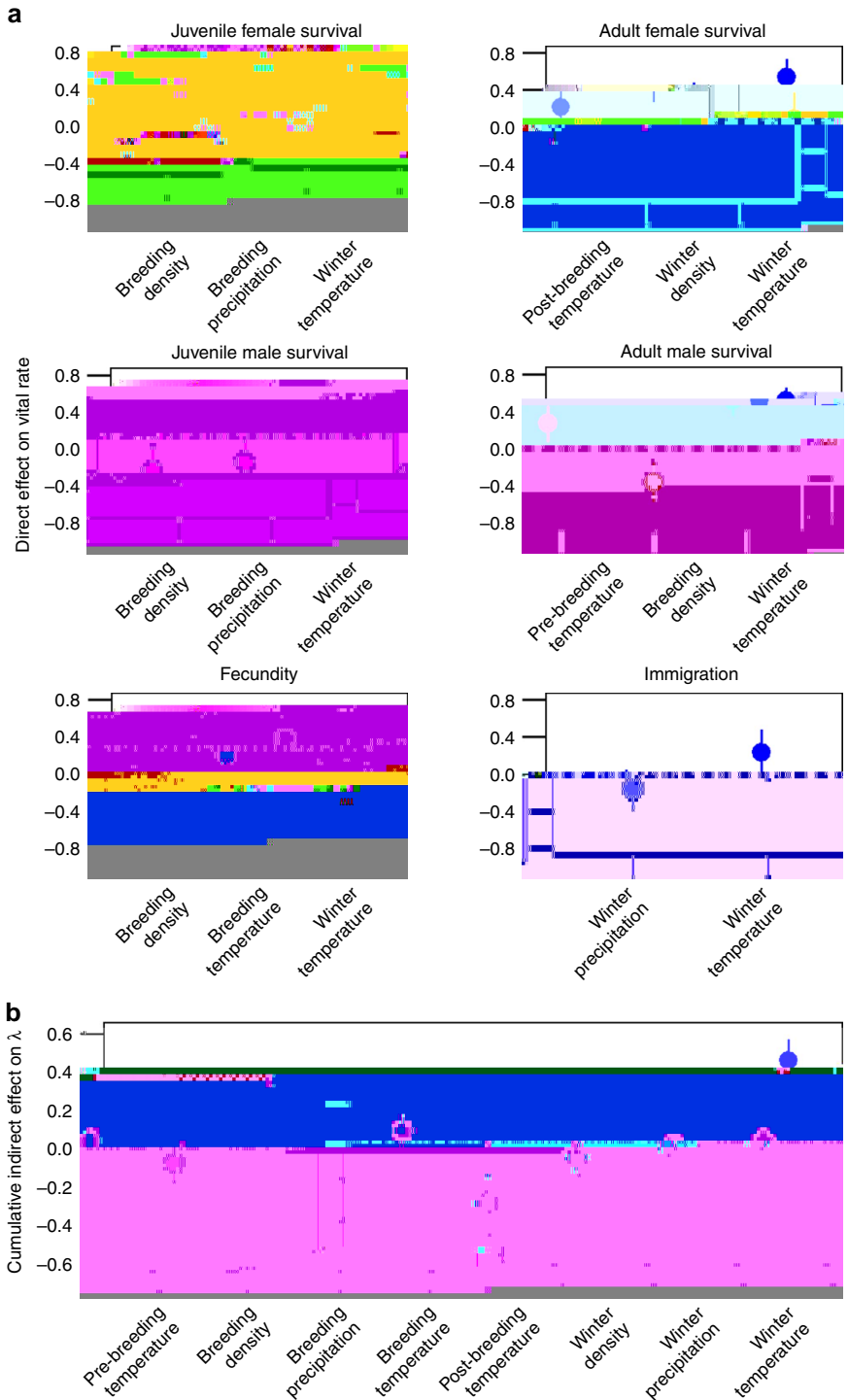


Figure 4 | Effect of environmental variables on vital rates and population growth rate (λ). (a) Direct effects of environmental variables on vital rates. (b) Cumulative indirect effects of environmental variables on λ . The size of the circles represents the magnitude of the effect, and the color represents the sign of the effect. The error bars represent the 95% confidence interval. The variables are ordered by their cumulative indirect effect on λ .

$$\pm \quad =$$

$$= \pm R^2 =$$

illegible text

e al.

D i r e c t i o n a l d e f i n i t i o n

$$\lambda \sim \varphi_{1,1} + \varphi_{1,2} + \varphi_{1,3} + \varphi_{1,4} + \dots + \varphi_{1,n} \quad (1)$$

$$\varphi_{1,1} \sim \varphi_{1,2} + \varphi_{1,3} + \varphi_{1,4} + \dots + \varphi_{1,n} \quad (2)$$

$$\varphi_{1,2} \sim \varphi_{1,3} + \varphi_{1,4} + \dots + \varphi_{1,n} \quad (3)$$

$$\varphi_{1,3} \sim \varphi_{1,4} + \dots + \varphi_{1,n} \quad (4)$$

$$\varphi_{1,4} \sim \dots + \varphi_{1,n} \quad (5)$$

$$\dots \sim \varphi_{1,n} \quad (6)$$

$$\varphi_{1,n} \sim \varphi_{1,n} \quad (7)$$

e al.