Table 2: Model structure specification for survival ($\phi$), recapture ($p$), smolting ($\alpha$), and emigration ($\rho$) with relatively common notation. Our notation is as follows: 1) subscripts indicate a discrete effect; 2) terms in parentheses indicate a continuous relationship; 3) terms such as $A \times B$ indicate both individual factor effects and interactions; 4) terms such as $A : B$ indicate interactions only; 5) terms such as $A, B, K$, with K constant, indicate a multi-dimensional spline; and 6) terms such as $A, K$, with K constant, indicate a single-dimensional spline with K knots. Each component model is transformed through the inverse logistic transformation to generate an event probability.

| Model# | Survival | Recapture | Smolting | Emigration |
|---|---|---|---|---|
| 0 | $\phi_S$ | $p_S$ | $\alpha_S$ | $\rho_S$ |
| 1 | $\phi_S$ | $p(d,4)$ | $\alpha_A$ | $\rho_S$ |
| 2 | $\phi_{A \times S}$ | $p(d,4)$ | $\alpha_A$ | $\rho_S$ |
| 3 | $\phi_{A \times S}$ | $p(d,4) + p_{OCC}$ | $\alpha_A$ | $\rho_S$ |
| 4 | $\phi_{A \times S} + \phi_{A+A:S}(T) + \phi_{A+A:S}(F) + \phi_S(T \times F)$ | $p(d,4)$ | $\alpha_A$ | $\rho_S$ |
| 5 | $\phi_{A \times S} + \phi_{A+A:S}(T) + \phi_{A+A:S}(F) + \phi_S(T \times F)$ | $p(d,4) + p_{OCC}$ | $\alpha_A$ | $\rho_S$ |
| 6 | $\phi_{A \times S} + \phi_{A+A:S}(T)^2 + \phi_{A+A:S}(F)^2 + \phi_S(T \times F)^2$ | $p(d,4) + p_{OCC}$ | $\alpha_A$ | $\rho_S$ |
| 7 | $\phi_S$ | $p(d,4) + p(dT) + p(d\log(F))$ | $\alpha_A$ | $\rho_S$ |
| 8 | $\phi_{A \times S}$ | $p(d,4) + p(dT) + p(d\log(F))$ | $\alpha_A$ | $\rho_S$ |
| 9 | $\phi_{A \times S}$ | $p(d,4) + p(dT) + p(d\log(F)) + p_{OCC}$ | $\alpha_A$ | $\rho_S$ |
| 10 | $\phi_{A \times S} + \phi_{A+A:S}(T) + \phi_{A+A:S}(F) + \phi_S(T \times F)$ | $p(d,4) + p(dT) + p(d\log(F))$ | $\alpha_A$ | $\rho_S$ |
| 11 | $\phi_{A \times S} + \phi_{A+A:S}(T) + \phi_{A+A:S}(F) + \phi_S(T \times F)$ | $p(d,4) + p(dT) + p(d\log(F)) + p_{OCC}$ | $\alpha_A$ | $\rho_S$ |
| 12 | $\phi_{A \times S} + \phi_{A+A:S}(T)^2 + \phi_{A+A:S}(F)^2 + \phi_S(T \times F)^2$ | $p(d,4) + p(dT) + p(d\log(F)) + p_{OCC}$ | $\alpha_A$ | $\rho_S$ |