$$
\begin{bmatrix}
n_{\text{Juvenile Year 1}} \\
n_{\text{Juvenile Year 2}} \\
n_{\text{Juvenile Year 3}} \\
n_{\text{Adult}}
\end{bmatrix}_{t+1}
=
\begin{bmatrix}
0 & 0 & 0 & F_a \\
S_j & 0 & 0 & 0 \\
0 & S_j & 0 & 0 \\
0 & 0 & S_j & P_a
\end{bmatrix}
\begin{bmatrix}
n_{\text{Juvenile Year 1}} \\
n_{\text{Juvenile Year 2}} \\
n_{\text{Juvenile Year 3}} \\
n_{\text{Adult}}
\end{bmatrix}_t
$$

where:

S_j = Annual survival for age < 3

P_a = Annual survival for age $\geq$ 3

F_a = Fecundity rate

and:

$$
F_a = P_a^{10/12} \times b \times m \times r
$$

where:

b = Pairing propensity for age $\geq$ 3

m = Chicks raised to mid-Aug per paired female

r = Assumed proportion of chicks that are female