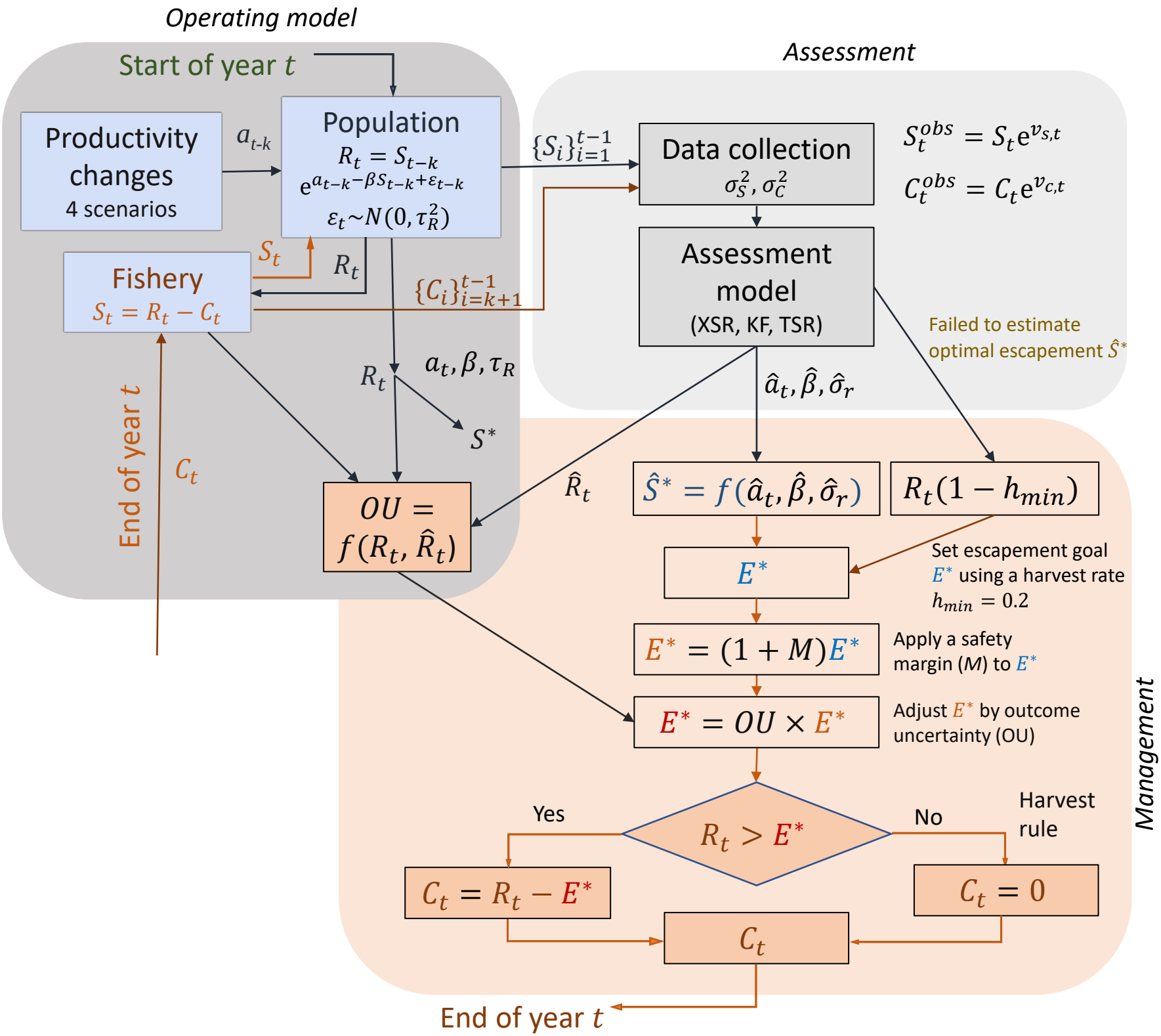
Operating model
Assessment
Management
Start of year t
Productivity changes
4 scenarios
a_{t-k}
Population
$R_t = S_{t-k}$
$e^{a_{t-k}-\beta S_{t-k}+\varepsilon_{t-k}}$
$\varepsilon_t \sim N(0, \tau_R^2)$
S_t
R_t
Fishery
$S_t = R_t - C_t$
$\{S_i\}_{i=1}^{t-1}$
$\{C_i\}_{i=k+1}^{t-1}$
Data collection
σ_S^2, σ_C^2
$S_t^{obs} = S_t e^{v_{s,t}}$
$C_t^{obs} = C_t e^{v_{c,t}}$
Assessment model
(XSR, KF, TSR)
Failed to estimate optimal escapement $\hat{S}^*$
$\hat{a}_t, \hat{\beta}, \hat{\sigma}_r$
R_t
a_t, β, τ_R
S^*
End of year t
C_t
$\hat{R}_t$
$OU = f(R_t, \hat{R}_t)$
$\hat{S}^* = f(\hat{a}_t, \hat{\beta}, \hat{\sigma}_r)$
$R_t(1 - h_{min})$
E^*
Set escapement goal E^* using a harvest rate $h_{min} = 0.2$
$E^* = (1 + M)E^*$
Apply a safety margin (M) to E^*
$E^* = OU \times E^*$
Adjust E^* by outcome uncertainty (OU)
Harvest rule
Yes
No
$R_t > E^*$
$C_t = R_t - E^*$
$C_t = 0$
C_t
End of year t