

## Input

### Parameters

*Derived from PS literature & data*

- $\varphi$ , average annual survival
- Initial length distribution<sup>s</sup>
- Joint distribution for growth parameters,  $L_{\infty}$  and  $k^B$

### Uncertainties

*Varied across a range of values*

- Average period of time between recruitment years<sup>B</sup>
- Average number of recruits given recruitment occurs<sup>B</sup>
- Movement probabilities<sup>b</sup>

## Population Simulator

## Output

### Reference Population, $P$ :

- $A_{i,t}$ , living status (alive/not alive)\*
  - $L_{i,t}$ , length
  - $b_{i,t}$ , bend location
- for individual  $i$  in year  $t$

<sup>B</sup>Basin specific, <sup>s</sup>segment specific, <sup>b</sup>bend specific

\*Note, annual bend abundance and recruitment numbers can be determined from  $A_{i,t}$