

Some specifics about including tagging data into stock synthesis

From Ian Taylor

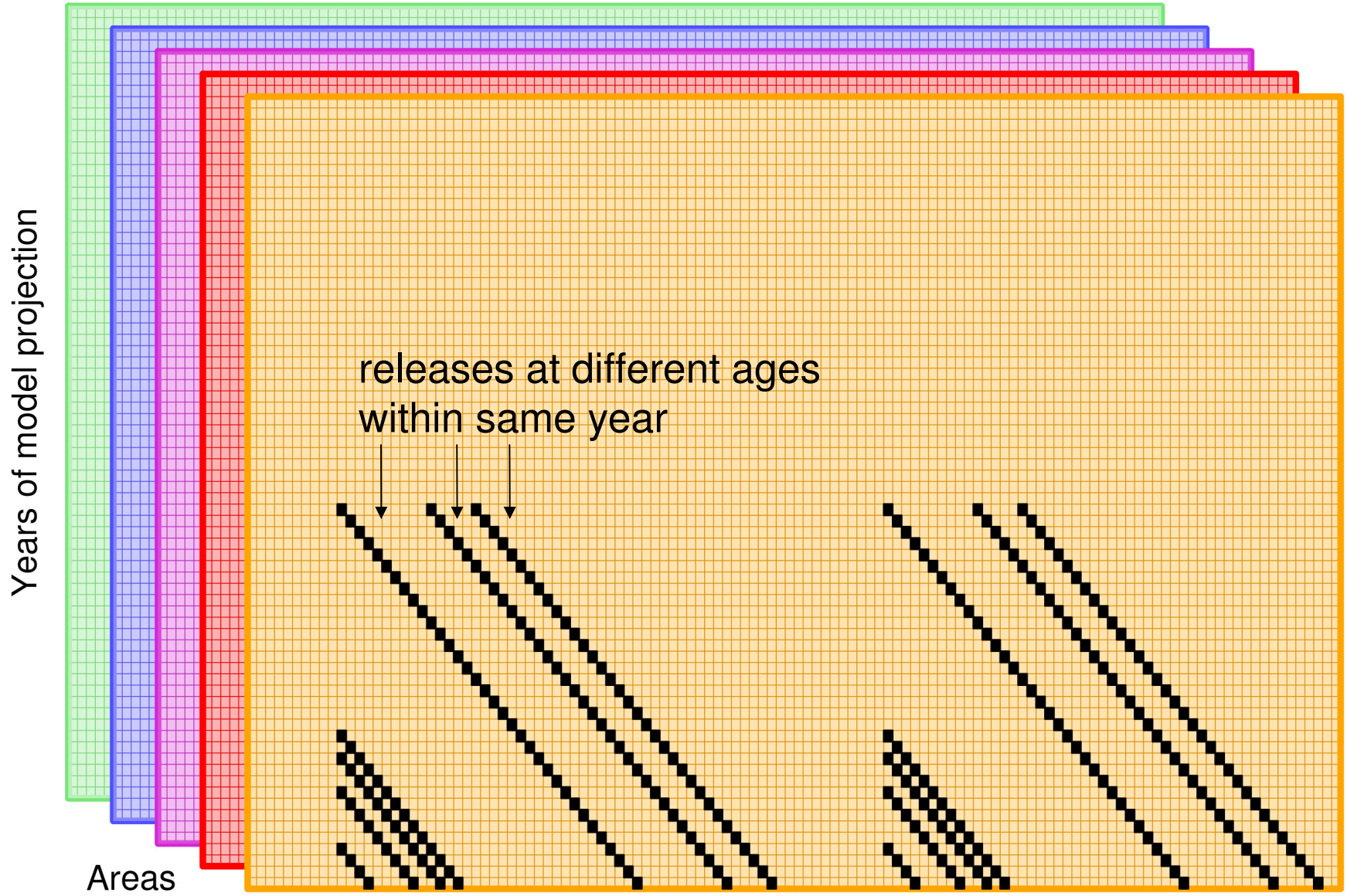
Stocks in Stock Synthesis

- Fundamentally Age-structured
- Distribution of lengths computed for each age
- Other population divisions include spatial area and growth pattern
- Tag group is an additional identifier for a subset of the population

Characteristics of tag groups (TG) in Stock Synthesis

- Year and season of release
- Release area
- Gender (female, male, or unsexed)
- Age at release
- Number of releases

Ages (females & males)



Recapture Data in Stock Synthesis

For each tag recapture event:

- TG, Year, Season, Fleet, N recaptures
- Fleet is specific to an area, so no need to read area of recapture
- Age is known from the assigned age at release and the elapsed time

Parameters for each tag type

- Initial tag loss (tag-induced mortality)
- Chronic Tag-loss rates (tag shedding)
- Tag-reporting rates
 - by group
 - could be more flexible
- Tags assigned fleet for release & fleet for recapture
- Assign recapture events into 3darray:
 - TG, the tag group
 - F, fleet doing the recapture event
 - TG_t, elapsed time (in count of seasons) since release

Tag Captures and Survival

```
Recap(TG,f,TG_t) +=  
TG_alive(p,g)  
* Sel_a(t,g,f,a1)*Hrate(t,f)  
/ (Z_rate(t,p,g,a1)+TG_loss(TG))  
*(1.-mfexp(-seasdur(s)*(Z_rate(t,p,g,a1)+TG_loss(TG))))  
* TG_report(f)
```

Where TG_t is a counter to index the time period of recaptures, it increments with passage of each season

Then do survival:

```
TG_alive(p,g)*= mfexp(-seasdur(s)*(Z_rate(t,p,g,a1)+TG_loss(TG)));
```

Tag Movement Between Areas at End of Each Season

```
TG_alive_temp=TG_alive; // has (p,g) dimensions
TG_alive=0.0;
for (g=1;g<=gmorph;g++)
if(use_morph(g)>0)
{
  for (p=1;p<=pop;p++) // source population
  for (p2=1;p2<=pop;p2++) // destination population
  {
    k=move_pattern(s,g,p,p2); // does movement occur?
    if(k>0) TG_alive(p2,g) +=
TG_alive_temp(p,g)*migrrate(y,k,a1);
  }
}
```

Use
movement
definition, k

Only need to
deal with one
age at a time

Example of observed and expected recaptures by tag group

Fit to tag recaptures by tag group

