4.5 Read setup and parameters for natmort, growth, biology, recr dist, and migration

Read natM_type

natM_type == 0? — **Yes** → N_natMparm = 1

No

natM_type == 1? — **Yes** → Read N_natMparm

No

natM_type == 2? — **Yes** → Read natM_amin N_natMparm = 1

No

natM_type >= 3? — **Yes** → N_natMparm = 0 set k1 for age_natmort

For natM_type 1, Read breakpoints (NatM_break)

For natM_type 3 and 4, Read Age_NatMort

Read Grow_type

Grow_type == 1, 2, or 8? — **Yes** → Read AFIX, AFIX2, Linf_decay do_ageK=0

No

Grow_type == 3, 4, or 5? — **Yes** → Read AFIX, AFIX2, Linf_decay, Age_K_count do_ageK=1

No

Grow_type == 1? — **Yes** → N_growparms = 5

No

Grow_type == 2 or 8? — **Yes** → N_growparms = 6

No

Grow_type == 8? — **No**

do_ageK? → N_growparms = 5 + Age_K_count

Grow_type == 6? → N_growparms = 2 k1 = N_GP*gender

Set AFIX2_forCV
Set AFIX_delta
Set AFIX_plus
set N_M_Grow_parms

```mermaid
flowchart TD

    A{g > gmorph?} -->|Yes| B
    A -->|No| C{use_morph?}
    C -->|Yes| D{a > nages?}
    C -->|No| E[Set lin_grow = 0]
    D -->|Yes| F
    D -->|No| G{s > nseas?}
    G -->|Yes| H
    G -->|No| I{subseas > N_subseas?}
    I -->|Yes| J
    I -->|No| K{real_age < AFIX?}
    K -->|Yes| L[Set lin_grow = real_age/AFIX_plus]
    K -->|No| M{real_age == AFIX?}
    M -->|Yes| N[Set lin_grow = 1.0]
    M -->|No| O{first_grow_age(g) == 0?}
    O -->|Yes| P[Set lin_grow = -1.0]
    O -->|No| Q[Set lin_grow = 2.0]
    P --> R{subseas == N_subseas?}
    R -->|Yes| S[Set first_grow_age = a]
    R -->|No| T

    U{AFIX2 != 999?} -->|| V[Set AFIX2 = 999]
    W{AFIX != 0.0?} --> X[Set AFIX = 0.0]
```

- g > gmorph? — No / Yes
- use_morph? — No / Yes
- a > nages? — No / Yes
- s > nseas? — No / Yes
- subseas > N_subseas? — No / Yes
- real_age < AFIX? — No / Yes
- Set lin_grow = 0
- Set lin_grow = real_age/AFIX_plus
- real_age == AFIX? — No / Yes
- Set lin_grow = 1.0
- first_grow_age(g) == 0? — No / Yes
- Set lin_grow = -1.0
- Set lin_grow = 2.0
- subseas == N_subseas? — No / Yes
- Set first_grow_age = a
- AFIX2 != 999?
- Set AFIX2 = 999
- AFIX != 0.0?
- Set AFIX = 0.0

```
                                    ┌──────────────────┐
         ◇ Age_K_points > 0? ◇ ──Yes──▶│ Read Age_K_points │
                 │                       └──────────────────┘
                 No                               │
                 ▼                                │
        ┌──────────────────┐                     │
        │ Read Len_At_Age_rd │◀───────────────────┘
        │ Read SD_add_to_LAA │
        │ Read CV_depvar     │
        └──────────────────┘
                 │
                 ▼
        ◇ Age_K_count > 1? ◇──Yes──▶◇ Grow_type == 3? ◇──Yes──▶◇ Age_K_points in
                                                                 ascending order? ◇──Yes──┐
                                           │                          │                   │
                                           No                         No                  │
                                           │                          ▼                   │
                                           │                      ( Exit(1) )             │
                                           ▼                                              │
                              ◇ Grow_type == 4 or 5? ◇──Yes──▶◇ Age_K_points in           │
                                           │                   descending order? ◇──Yes──▶│
                                           No                         │                   │
                                           │                          No                  │
                                           │                          ▼                   │
                                           │                      ( Exit(1) )             │
                                           ▼                                              │
                                           │◀─────────────────────────────────────────────┘
                                           ▼
        ◇ CV_depvar == 0? ◇──Yes──▶┌──────────────────┐
                 │                 │ CV_depvar_a = 0   │
                 No                │ CV_depvar_b = 0   │──┐
                 ▼                 │ Grow_logN = 0     │  │
        ◇ CV_depvar == 1? ◇──Yes──▶└──────────────────┘  │
                 │                 │ CV_depvar_a = 1   │──┤
                 No                │ CV_depvar_b = 0   │  │
                 ▼                 │ Grow_logN = 0     │  │
        ◇ CV_depvar == 2? ◇──Yes──▶┌──────────────────┐  │
                 │                 │ CV_depvar_a = 0   │──┤
                 No                │ CV_depvar_b = 1   │  │
                 ▼                 │ Grow_logN = 0     │  │
        ◇ CV_depvar == 3? ◇──Yes──▶┌──────────────────┐  │
                 │                 │ CV_depvar_a = 1   │──┤
                 No                │ CV_depvar_b = 1   │  │
                 ▼                 │ Grow_logN = 0     │  │
        ◇ CV_depvar == 4? ◇──Yes──▶┌──────────────────┐  │
                 │                 │ CV_depvar_a = 1   │──┤
                 No                │ CV_depvar_b = 1   │  │
                 ▼                 │ Grow_logN = 1     │  │
              ( 4.5.2 )◀───────────└──────────────────┘──┘
```