Data 2006: 106 flowering (reproductive) plants of 252 in total

“Important” variables: FFD, shoot\_vol, cum\_n\_fl, fruits and seeds, grazing (ok, calculated for all as proportion of shoots grazed)

Categories for each “important” variable

FFD

* ok=keep (only correct from among-census to high-resolution FFD --> FFD\_corr – to be done later)
* impute (using n flowers and volume)
  + no info on FFD
  + FFD was taken from an original shoot but 50% or more of original shoots were grazed
  + FFD was taken from a replacement shoot
* ok\_g = when FFD was taken from an original shoot and <50% shoots were grazed
* withered=flowers were withered when first seen, FFD should be adjusted to an earlier date (using bud size) – to be done later
* ok\_added=no FFD on columns BB-BK, but date was added as the first census date when flowers were seen (columns AR-BA)
* NA=not available (vegetative/pl not found)

shoot\_vol

* ok=keep
* impute=no information at all about shoot diameter or height, impute using FFD and n flowers
* recalc=there is info about shoots, but does not match the n shoots in the beginning
  + E.g. higher n shoots in the beginning than when info on shoots was recorded 🡪 repeat info available? *If we had 3 shoots in the beginning but only info on 2, assume that the volume of the missing shoot is the average of the 2 shoots with info*
  + E.g. lower n shoots in the beginning than when info on shoots was recorded 🡪 maybe replacement shoots? Remove info from 1 shoot: the last noted OR the smallest?
  + E.g. shoots noted as grazed in the beginning but as intact when info on shoots was recorded 🡪 count them as grazed and recalculate height (see below)?
  + Height of grazed shoots was obtained by using correlations between diameters and heights (of intact shoots?) 🡪 redo this consistently and recalculate volume for all plants with grazed shoots
* NA=not available (vegetative/pl not found)

cum\_n\_fl (= “Tot n blm” in the file)

* impute: no value, impute using FFD and volume
* ok: use (no grazing, or all flowers were produced before grazing)
* grazed: there is a value noted but some or all flowers were produced after grazing. Flowers are produced in the original shoots. If there are replacement shoots, it is noted in comments that flowers are from original shoots. Grazing could have influenced number of flowers 🡪 keep this value or modify (how)/impute?
* grazed + repl: there is a value but some or all flowers were produced after grazing and it is not sure if flowers from replacement shoots are also counted🡪 keep this value or modify (how)/impute?
* NA=not available (vegetative/pl not found)

fruits and seeds (n\_fruits, n\_seeds, n\_pred\_seeds, n\_intact\_seeds)

* ok=data available, use
* grazed+repl: some or all flowers were produced after grazing and not sure if flowers from repl shoots are also counted 🡪keep this value?
* from\_repl: fruits and seeds come ONLY from repl shoots🡪keep this value? Or assign zero?
* NA=data not available (vegetative/plant not found OR no fruits/seeds)
  + vegetative/plant not found 🡪NA
  + plants with no fruits/seeds
    - plants that were not grazed and produced flowers but did not produce fruits 🡪0
    - plants that were grazed 🡪 0 or impute a value? (I think we should probably only impute traits, but not variables related to fitness, because having 0 fruits is here a consequence of grazing on fitness – am I right?)

IMPUTATIONS

* Which dataset should we use for imputation? I would use the whole dataset for the corresponding set of years (i.e. 1987-96 or 2006-17)
* For FFD, follow this order: 1) correct plants with withered flowers using bud size in previous visit, 2) calculate high-resolution FFD, 3) for plants where FFD needs to be imputed, impute using regression FFD high-resolution ~ n flowers and volume
* Sometimes both the variable that needs to be imputed and one (or more) of the variables using for imputation will be missing. What to do then?
  + E.g. missing FFD but available n flowers and volume 🡪 OK, impute FFD from n flowers and volume
  + E.g. missing FFD and n flowers, but available volume
    - impute FFD from volume? (if the fit is good?)
    - impute n flowers from volume? (if the fit is good?)
  + E.g. missing FFD, n flowers and volume 🡪 Shall we remove the plant? (probably not many cases, especially after recalculating volume)