

RAINFOR field work database codes for trees

FLAG 1: ALIVE STATUS (for dead trees = 0).

a = alive normal

b = alive, broken stem/top & resprouting, or at least phloem/xylem. Note at what height stem is broken.

c = alive, leaning by $\geq 10\%$

d = alive, fallen (e.g. on ground)

e = alive, tree fluted and/or fenestrated

f = alive, hollow

g = alive, rotten

h = multiple stemmed individual (each stem > 99 mm gets a number), always use with another code – e.g. if a tree is normal and with multiple stems, use 'ah', etc.

i = alive, no leaves/few leaves

j = alive, burnt

k = alive snapped < 1.3 m

l = alive, has liana ≥ 10 cm d on stem or in canopy

m = covered by lianas (note only in the case where canopy is at least 50% covered by lianas, even where no individual liana reaches 10 cm d)

n = new (recruit), always use with another code – e.g. if a tree is normal and new the code = 'an', if a tree is broken and new the code is 'bn', etc.

o = lightning damage

p = cut

s = has strangler

t = is a strangler

z = alive, declining productivity (nearing death, diseased etc.)

Note: tree status codes can be used together in whatever combination is necessary! Thus, for example, a multiple stemmed, leaning and broken tree would be coded *bch*

Developed in 2005-2007 by RAINFOR participants

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FLAG 2: MODE OF DEATH (for alive trees = 1)

1) Physical Mechanism of Mortality (How the tree died)

- a = standing
- b = broken (snapped trunk)
- c = uprooted (root tip-up)
- d = standing or broken, probably standing (not uprooted)
- e = standing or broken, probably broken (not uprooted)
- f = standing or broken (not uprooted)
- g = broken or uprooted, probably uprooted
- h = broken or uprooted, probably broken
- i = broken or uprooted (not standing)
- j = anthropogenic
- k = vanished (found location, tree looked for but not found)
- l = presumed dead (location of tree not found e.g. problems, poor maps etc)
- n = burnt
- o = lightning

2) Number of trees in Mortality Event

- p = died alone (i.e., did not die with another tree; it can have died with a liana or strangler) – GO TO PART 3
- q = one of multiple deaths – GO TO PART 3
- r = died alone or one of multiple deaths (unknown)

3) Killed or killer

- s = killed or killer (unknown)
- t = killer
- u = killed, no more information
- v = killed by tree that died broken
- w = killed by another tree that uprooted
- x = killed by branches fallen from dead standing tree
- y = killed by branches fallen from living tree
- z = killed by strangler
- 2 = killed by liana
- 3 = killed by strangler/liana weight [tree died broken or fallen], use in combination with z and/or 2
- 4 = killed by strangler/liana competition [tree died standing], use in combination with z and/or 2

Note: tree death codes can be used together in whatever combination is necessary! (for example, *op* = killed by lightning alone; *jl* = presumed dead, anthropogenic).

With multiple deaths the number of trees died should to be recorded. In the database this gets entered in the “comments” field.

With broken trees the height at which the breakage occurred should to be recorded.

If liana(s)/strangler(s) were involved in killing the killer tree, then any trees which are in turn killed by the killer tree need to be linked to the ultimate cause of death. For each tree which is killed this way we propose putting the ultimate cause of death in brackets. So, for example: *qv(2)* or *qw(3)* or *qx(4)*.

FLAG 3: MEASUREMENT TECHNIQUE

- 0 = normal measurement, tape measure
- 1 = relascope
- 2 = digital camera
- 3 = estimate
- 4 = ladder, with diameter tape
- 5 = unknown

FLAG 4: DATA MANIPULATION

- 0 = normal measurement (no retrospective modification)
- 1 = extrapolated from previous measurements forwards, or final measurement backwards
- 2 = correct expected typographical error
- 3 = interpolated (two good measurements either side of a problem measurement)
- 4 = estimation using median growth rates
- 5 = data converted from imperial units to metric units
- 6 = the POM was changed because it had to be, good measurement before
- 7 = zero growth rate assumed
- 8 = another transformation, see notes / it is not clear what was done
- 9 = zero growth.

Comments: Everything else! If a tree is outside a plot, add to comments, but leave blank in census data.