Age, growth and demography of several populations of *Potomida littoralis* in northeast of Catalonia.

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AREA OF STUDY

In north-eastern Catalonia *Potomida littoralis* is in the worst situation of all naiads: only four known populations, with a few observed living animals in each site. These populations are placed in small sections of Llémena and Fluvià Rivers, in Banyoles Lake, and also in an irrigation channel of the low Ter River flood plain (Riera Nova). In first three places, less than five alive individuals have been found recently after extensive prospections, but in the irrigation channel we have found 176 alive individuals.

These 4 water masses are quite different systems. Rivers have a typical mediterranean hydrographic regime -high flow variations-, and quite hard riverbeds with boulders and gravels. However, Banyoles Lake and the irrigation channel have stable water or flow level, with soft bottoms.
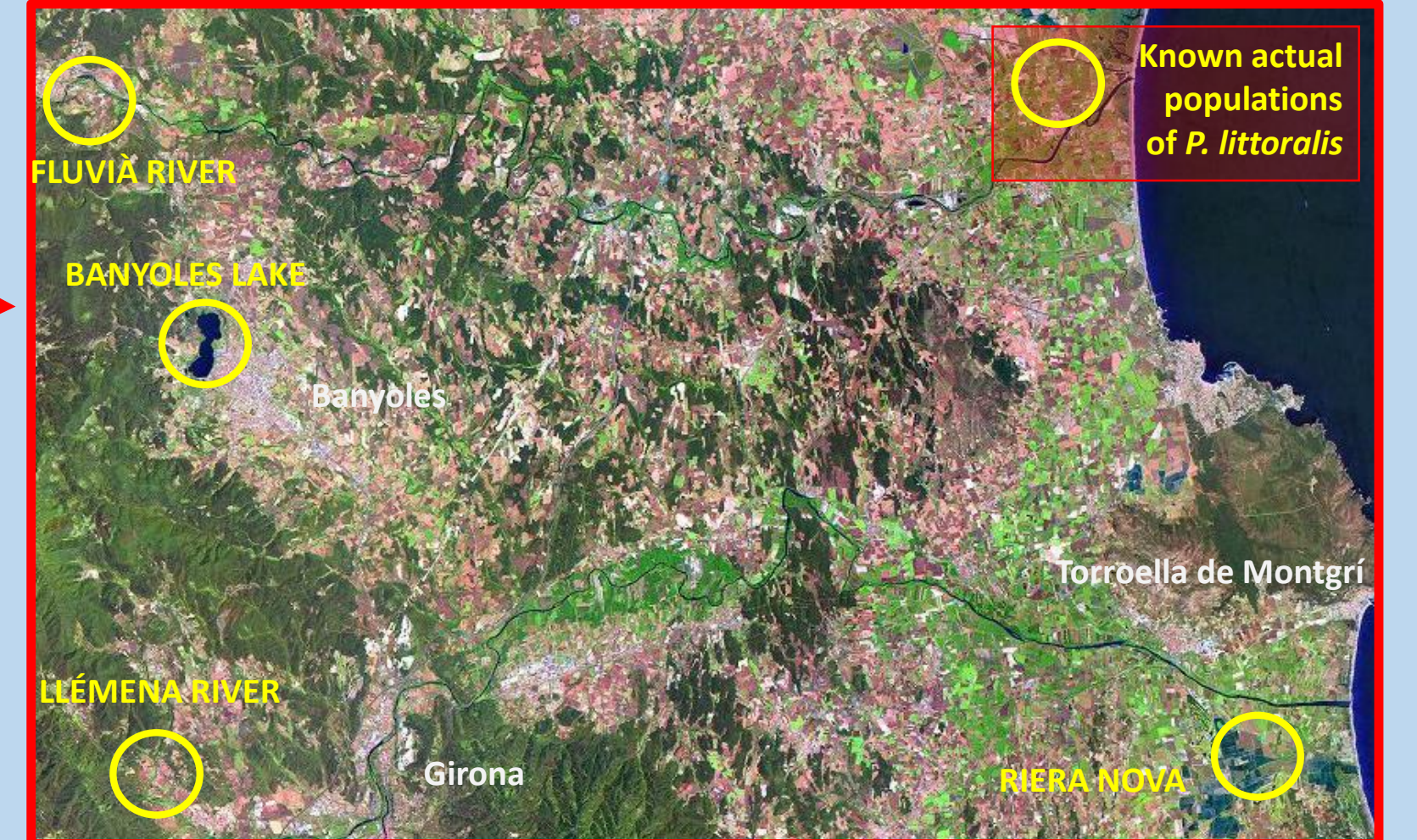
METHODOLOGY

Along last ten years, we have surveyed these populations. Samplings consist in exhaustive "manual" or visual prospections of riverbeds and bottoms. Age has been determined by means of lectures of internal annual marks on shell sections. Growth is described through adjustments of the Von Bertalanffy Growth Model (VBGM), obtained by non linear regression. Demography is analysed over the age structure of each population.

SECTIONING WITH A DIAMOND BAND SAW

VBMG
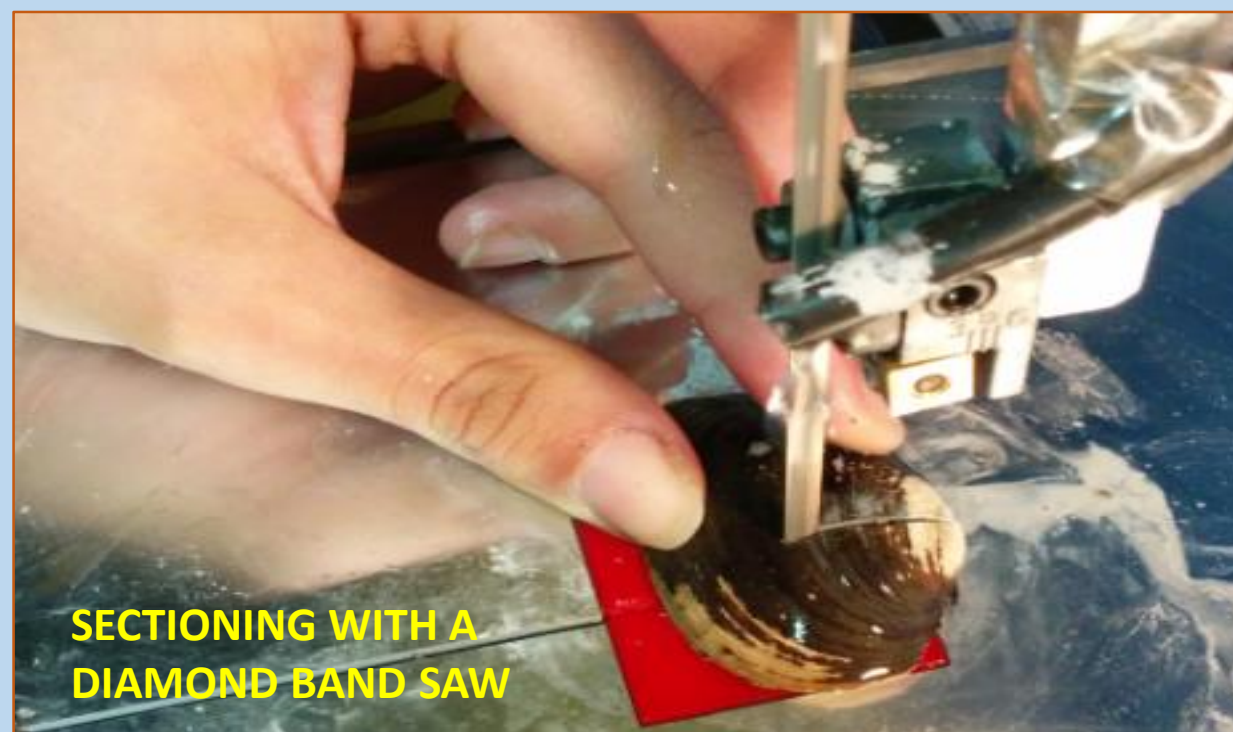
$$L_t = L_\infty (1 - e^{-K(t-t_0)})$$

VARIABLES:
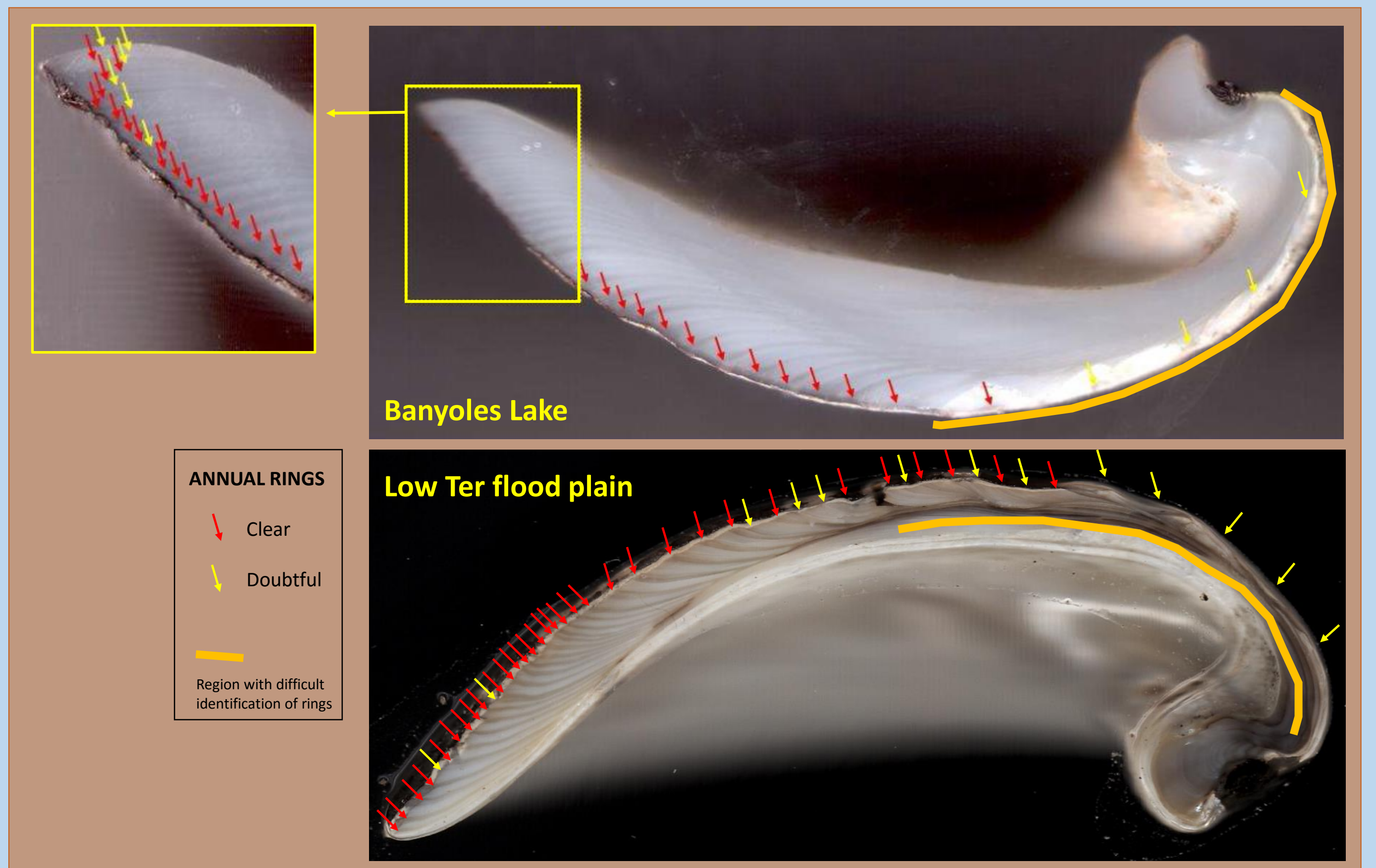L_t = length at age t [mm]
t = age [year]

PARAMETERS:
L_∞ = asymptotic length [mm]
K = growth rate [year^{-1}]
t_0 = "theoretical" age at length 0

RESULTS

Age determination is uncertain and non definitive. A first attempt to read the age on shells sections coming from low Ter River flood plain produced a maximum age of 22 years, which posteriorly has been solved as a sub estimation. A new polish method of shells has lead to age readings highly superior. Anyway, in many shells is not possible to visualize properly the rings, so age determination is not possible in these individuals. On the other hand, all shells present a region in the youngest part where rings are scarcely marked, so that it is not possible to discard a new general sub estimation of age.
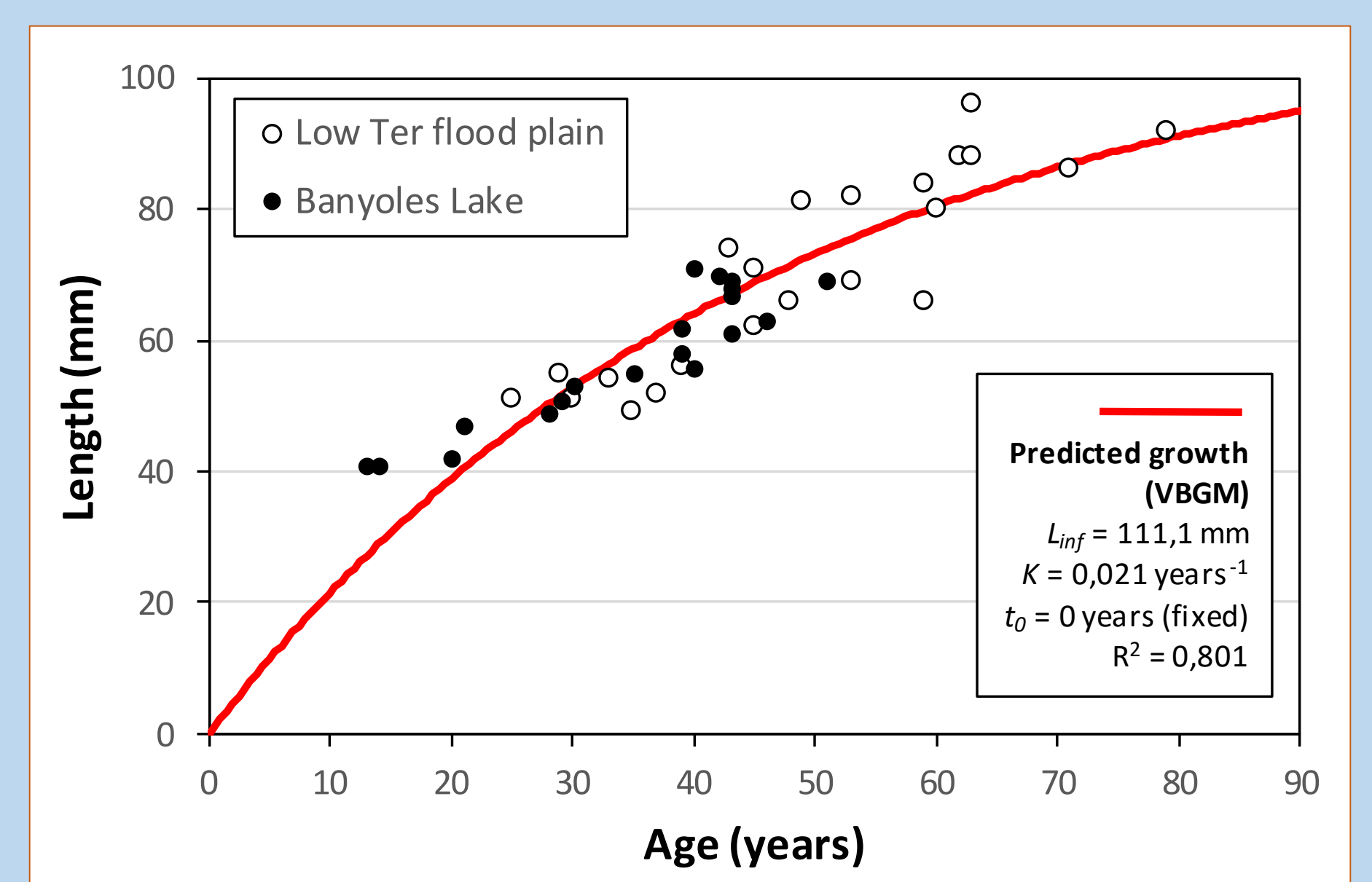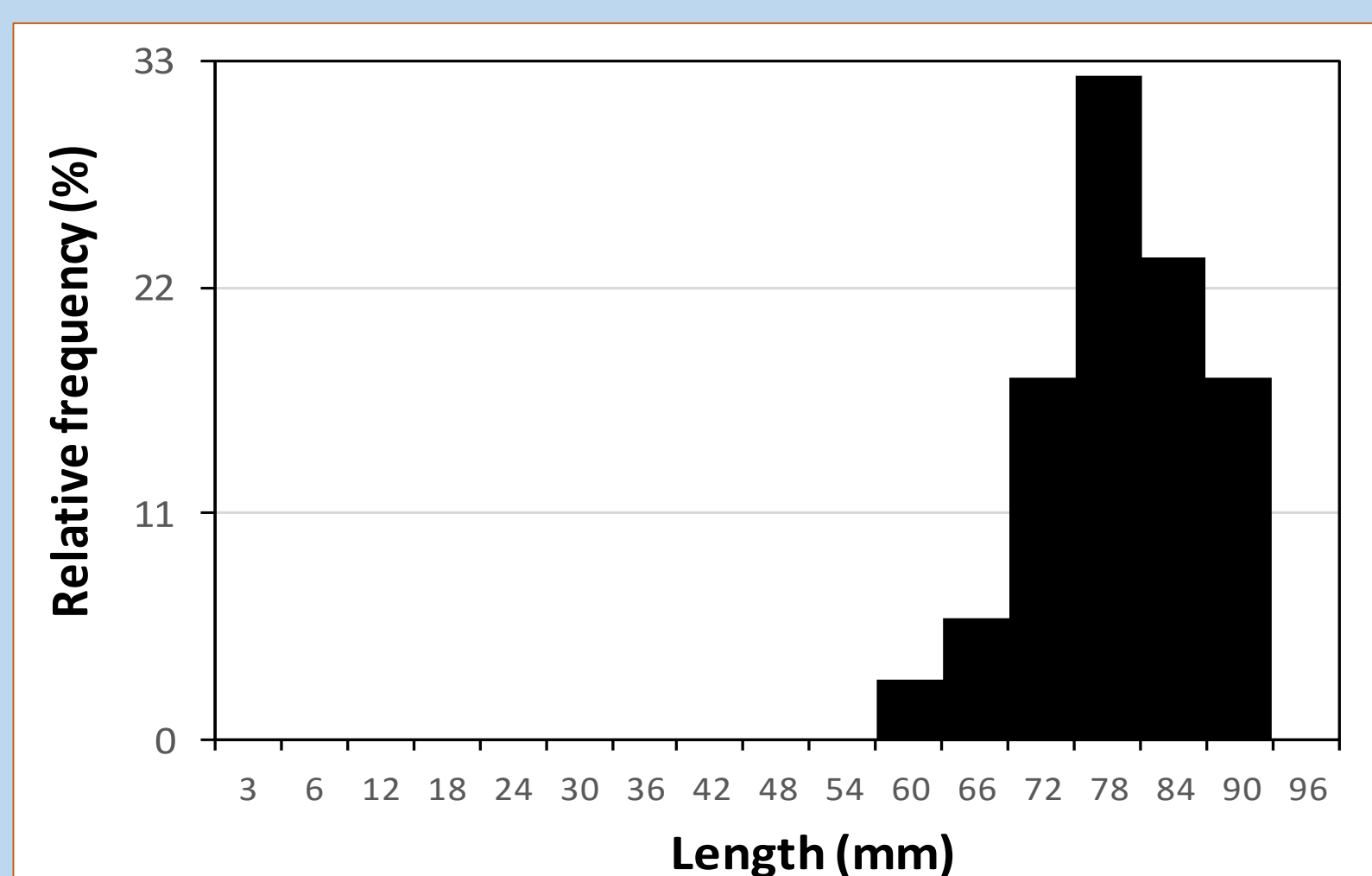
Maximum longevity observed for the whole area is 81 years, but that needs confirmation through new studies. Overall estimated growth rate (K parameter from VBGM) is very low, 0.021 year^{-1}. Growth is actually very slow, although we don't have reliable information about growth during first years of life. In all populations there's a complete lack of effective reproduction, or at most they have a very sporadic and token recruitment. So, these populations nowadays are clearly on the brink of an imminent extinction. The only reason for its persistence till now is the great longevity of the species.

Banyoles Lake
Low Ter flood plain

ANNUAL RINGS
→ Clear
→ Doubtful
Region with difficult identification of rings

MARK-RECAPTURE
(Direct growth data)

Directly observed growth increments in marked individuals are near zero (mean: 0,03mm), for a period of 1,5 years. That confirms an extremely slow growth rate.

Predicted growth (VBGM)
L_{inf} = 111,1 mm
K = 0,021 years^{-1}
t_0 = 0 years (fixed)
R^2 = 0,801