Nonparametric regression estimators are often employed to estimate growth curves. However, more than one smoothing parameter may be required to estimate growth curves for some species, particularly those with distinct life-stages. This can be problematic, especially if confidence intervals about the mean function are also required. Here a straightforward method, based on the spline estimator, is proposed. First, the natural history of the species in question is used to determine a finite number of possible partitions of the growth curve. If needed, the partitions are then adjusted so that they overlap. Next, a spliine estimator is fit to each partition. Finally, the individual estimators of the growth curve in each partition are blended together to form one coherent curve.

The resulting estimator remains a linear function of the data and converges to the true function at the same rate as the optimal single parameter spline estimator. Futher, mild conditions on how the partitions have been selected, and on the blending step are given, which ensure that the associated fiducial confidence intervals are asymptotically valid. Finally, data driven methods for making all of the required decisions are given.