Juvenile Chinook age estimation

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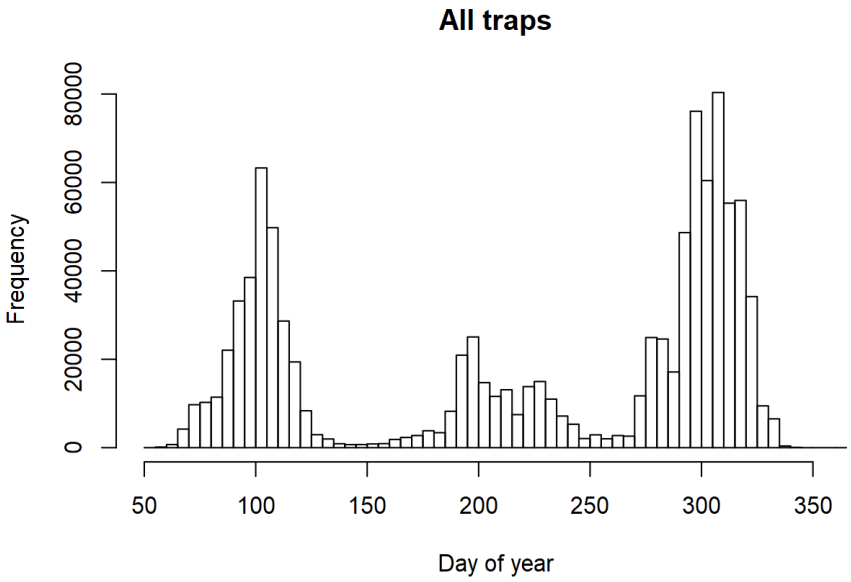
8/18/2020

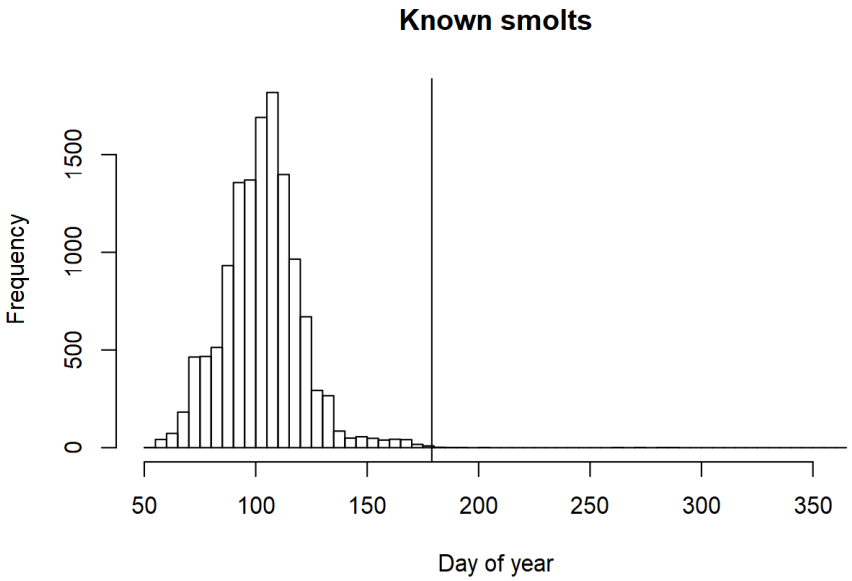
The purpose of this document is to explore how to determine the ages of juvenile Chinook captured in screw traps in the Wenatchee River Basin.

Histogram of capture day-of-year across all streams

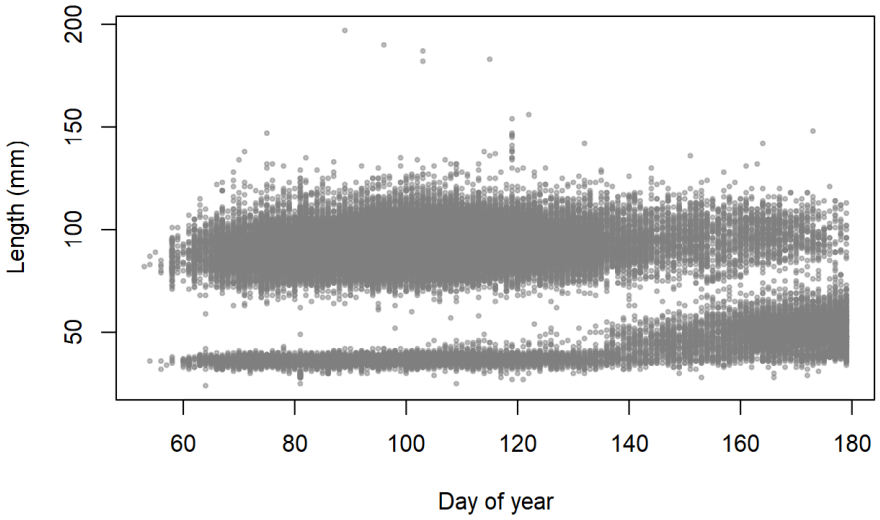


Histogram of capture day of year of known smolts (fish that were tagged at screw traps and subsequently detected at mainstem dams when migrating downstream, in the same year they were tagged)

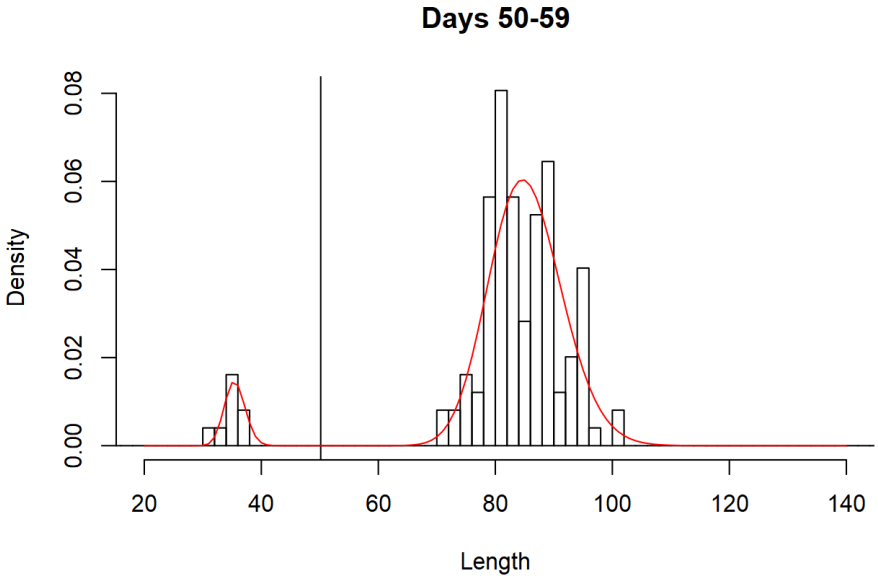
The 99.9th quantile of capture days-of-year for know smolts (n =12897) is **179**



Fish captured on or before day **179**



To create a line to separate subyearlings and yearlings: 1) fit a mixture distribution of two normal distributions to the log(length) data for each 10-day interval starting at day 50, 2) find the length corresponding to the minimum density between the two modes of the mixture distribution, and 3) connect the points.

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number of iterations= 9
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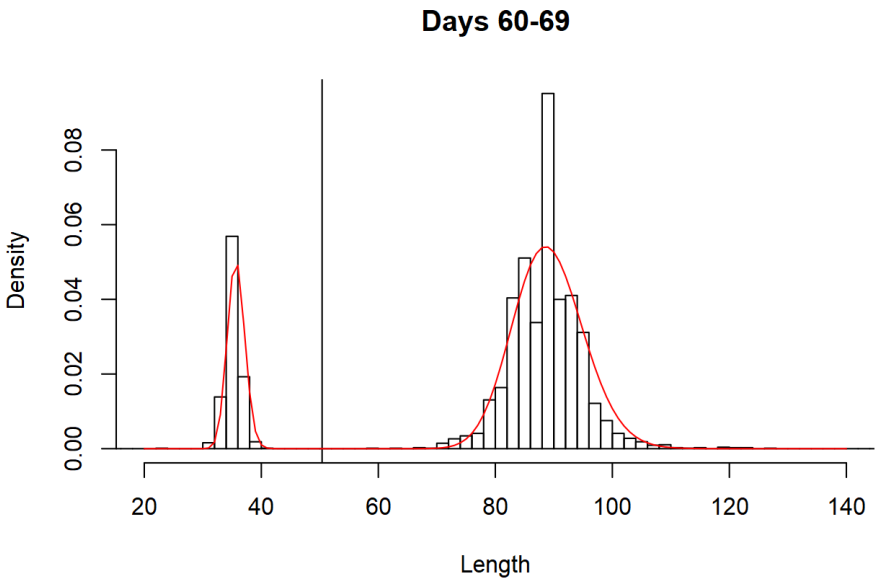


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number of iterations= 10
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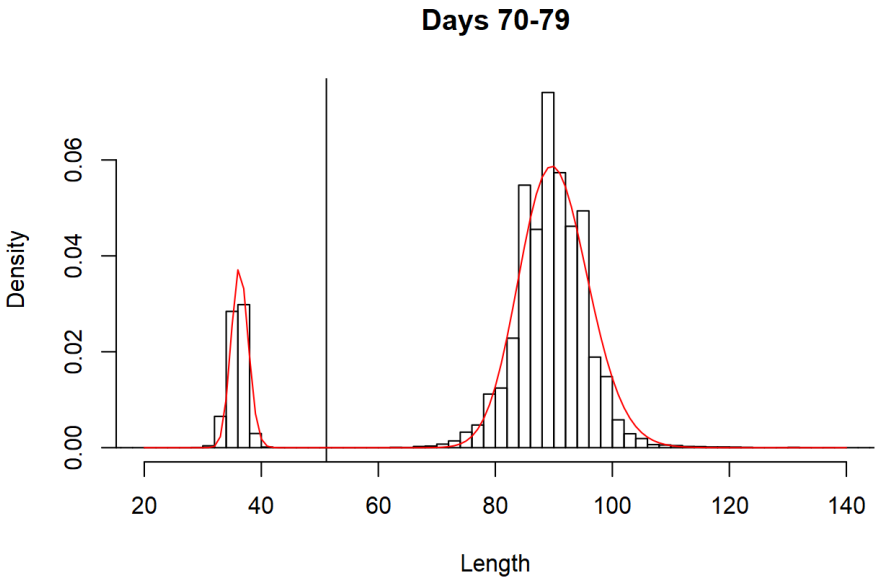


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number of iterations= 10
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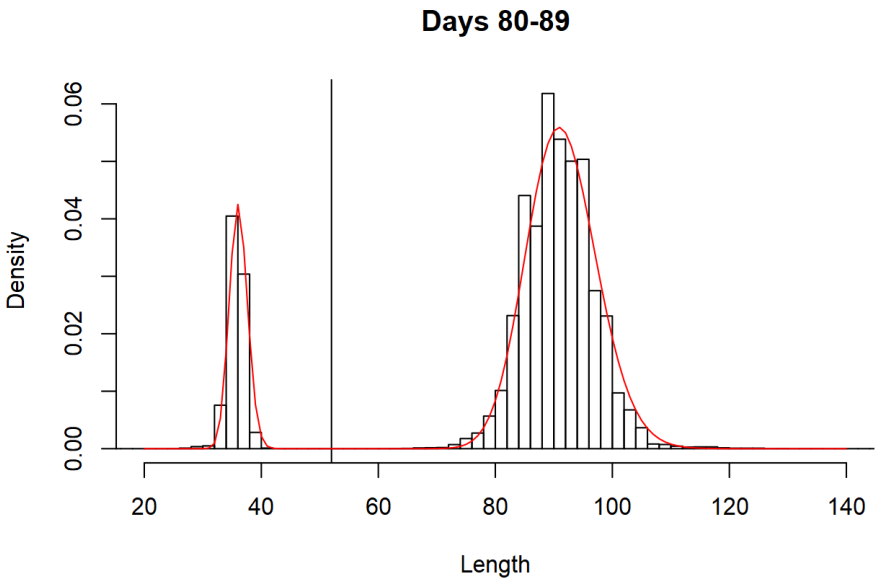


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number of iterations= 9
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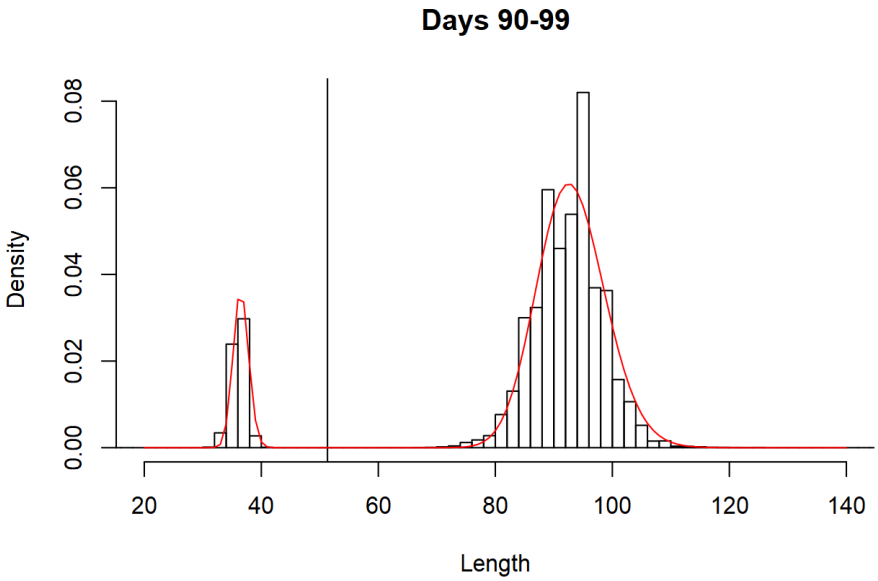


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number of iterations= 12
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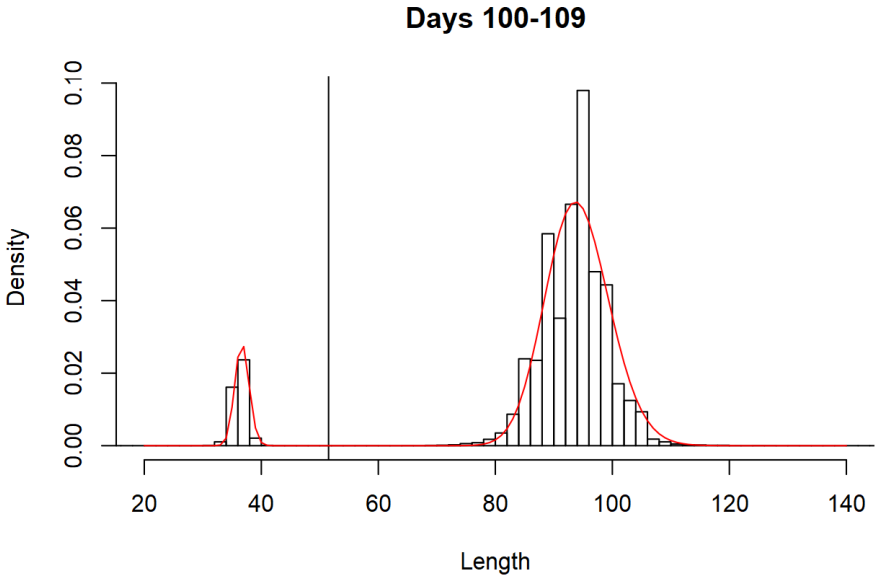


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number of iterations= 10
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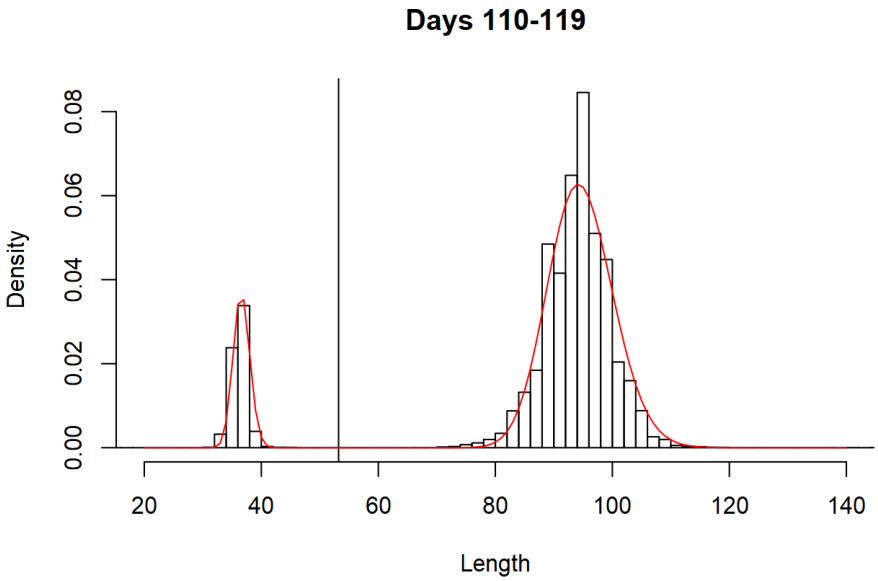


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number of iterations= 10
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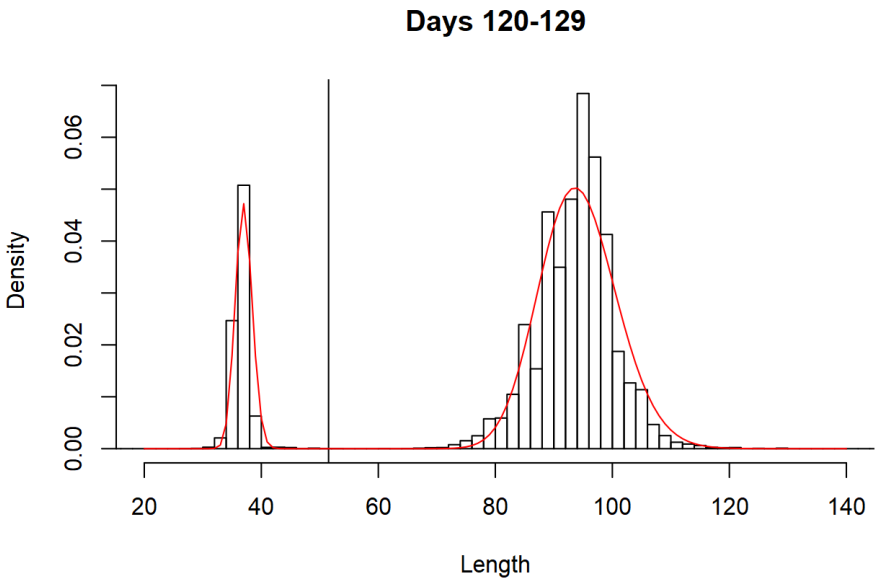


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number of iterations= 12
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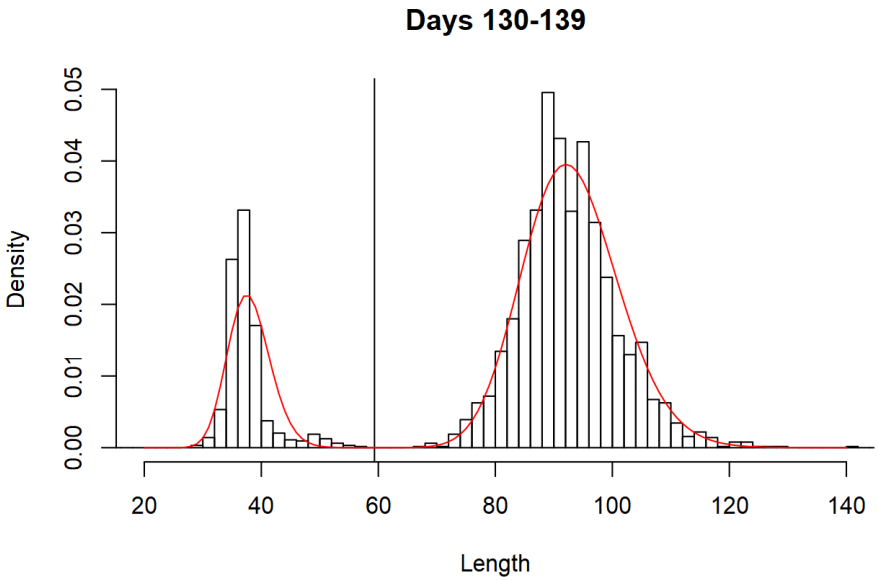


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number of iterations= 10
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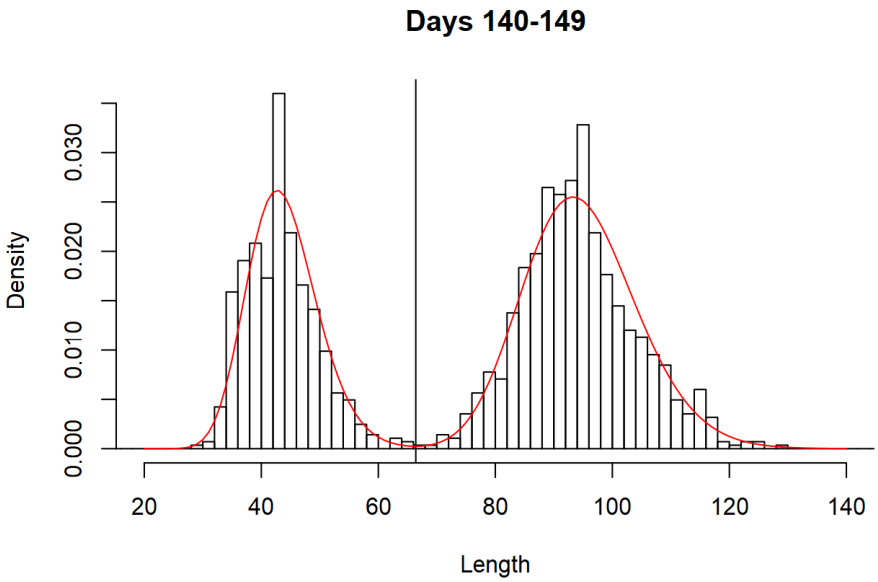


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number of iterations= 18
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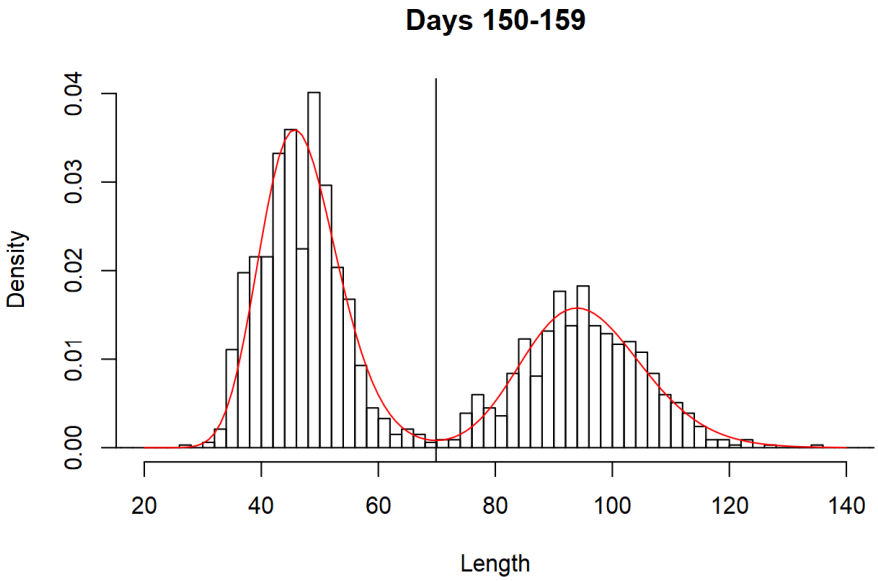


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number of iterations= 26
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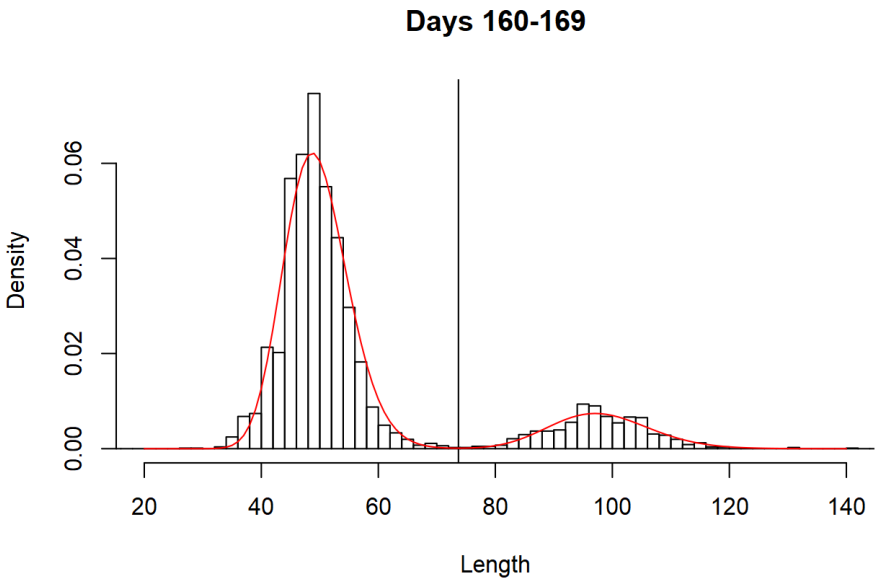


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number of iterations= 20
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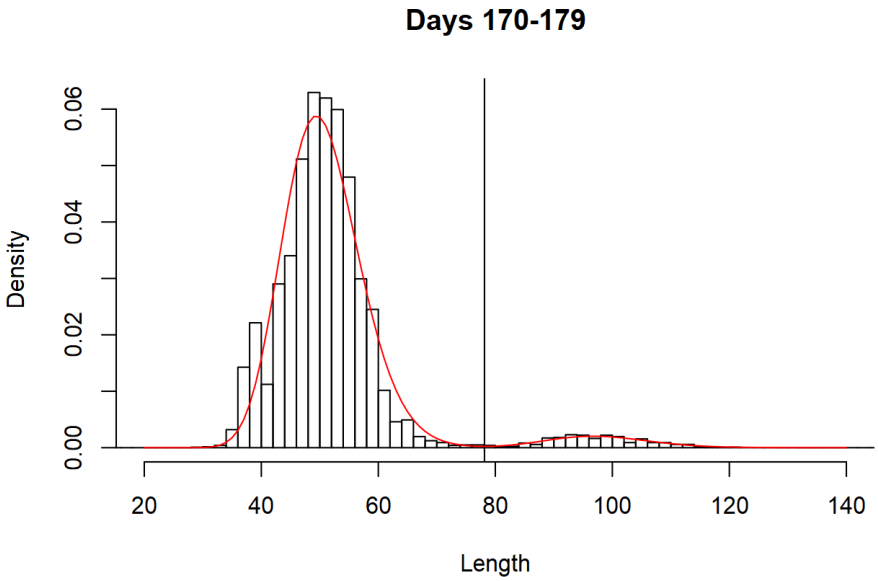


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number of iterations= 37
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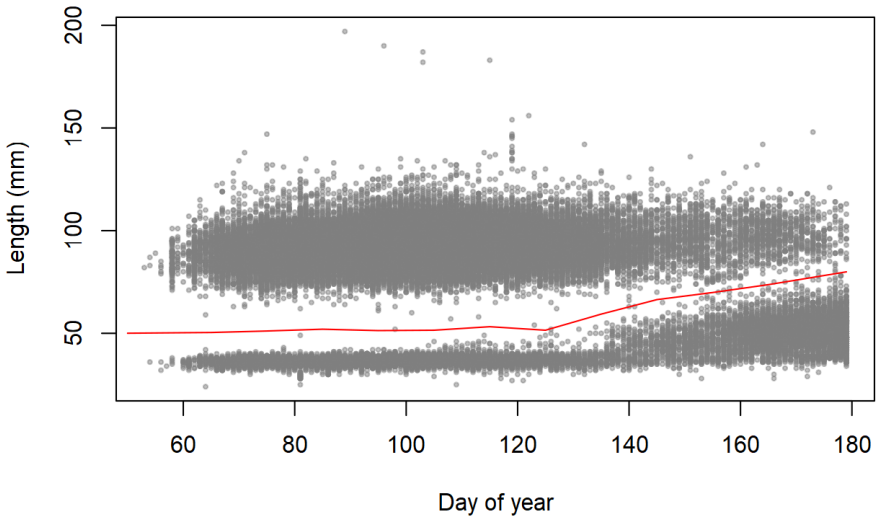
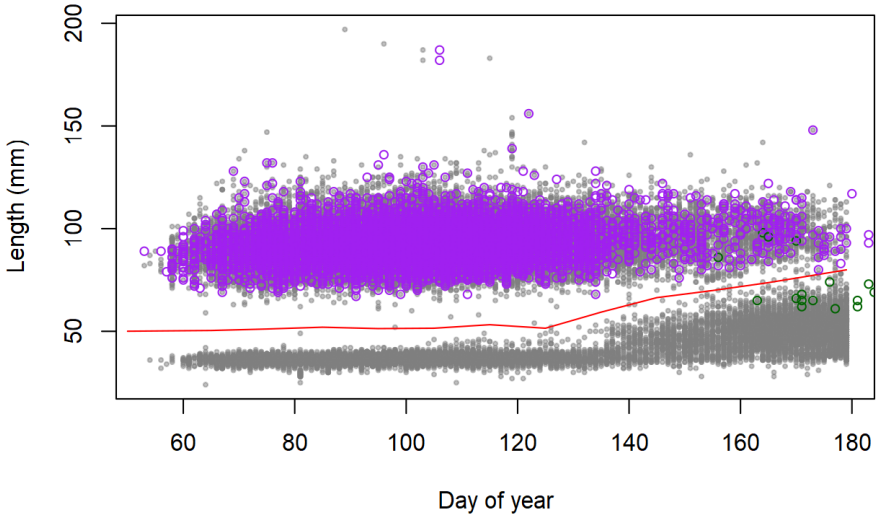
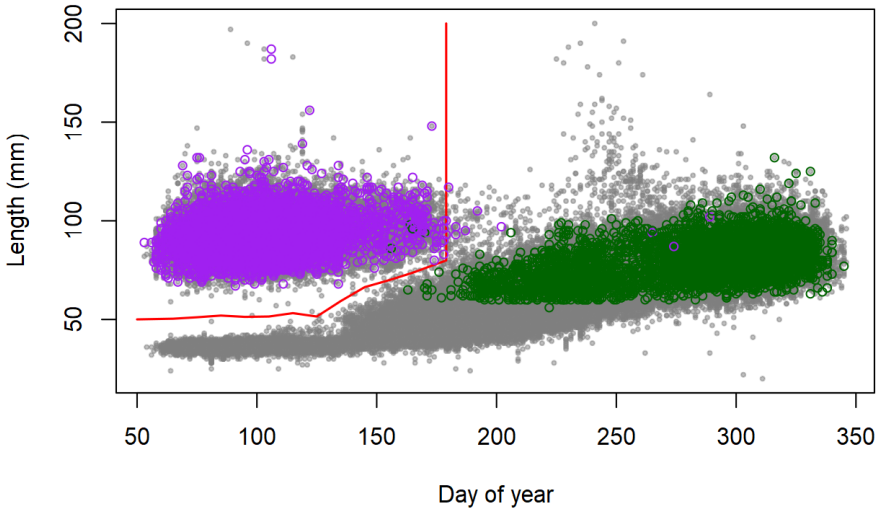
Add line to plot of fish captured on or before day **179**



Now overlay fish known to be subyearling and yearlings based on whether they were detected at mainstem dams when migrating downstream in the same year they were tagged or the next year.





Not bad

The assignment of “known age” fish n=(19517) is correct in 99.91% of cases