Data Documentation - Red rock crab (Cancer productus)

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Contents

Metadata

This data file is used for an investigation of the California rock crab fishery which targets a complex of three species. Biological parameters listed here represent only one species and sex - Red rock crab females. Fleet parameters reflect all three species. Most of the fishery's history can only be represented by landings and effort for all three species combined. Therefore the entire time series is analyzed that way here.

Table 1: Table 1. Summary of metadata

Name	Rock Crab
Common Name	Red Rock Crab Females
Species	Cancer productus
Region	NA
Last Historical Year	2018
Last TAC	NA
Units	NA
Last TAE	1
Number of areas	2

Biology

There have been no studies of rock crab natural mortality. The value is informed by general rules derived by Quinn & Deriso, estimates of natural mortality for Dungeness crab, and examination of MSE results allowing a small number of crabs to reach maximum observed sizes. Length at maturity is estimated from observations of the size of females with eggs (Orensanz & Gallucci 1988, Yamada & Groth 2016) *Von bertalanffy parameters are rough estimates based on maximum observed size in the literature (CDFW 2003, Yamada & Groth 2016) and size frequency distributions available in Culver et al. 2010.*
Steepness is assumed to be high which is typical for crustaceans.
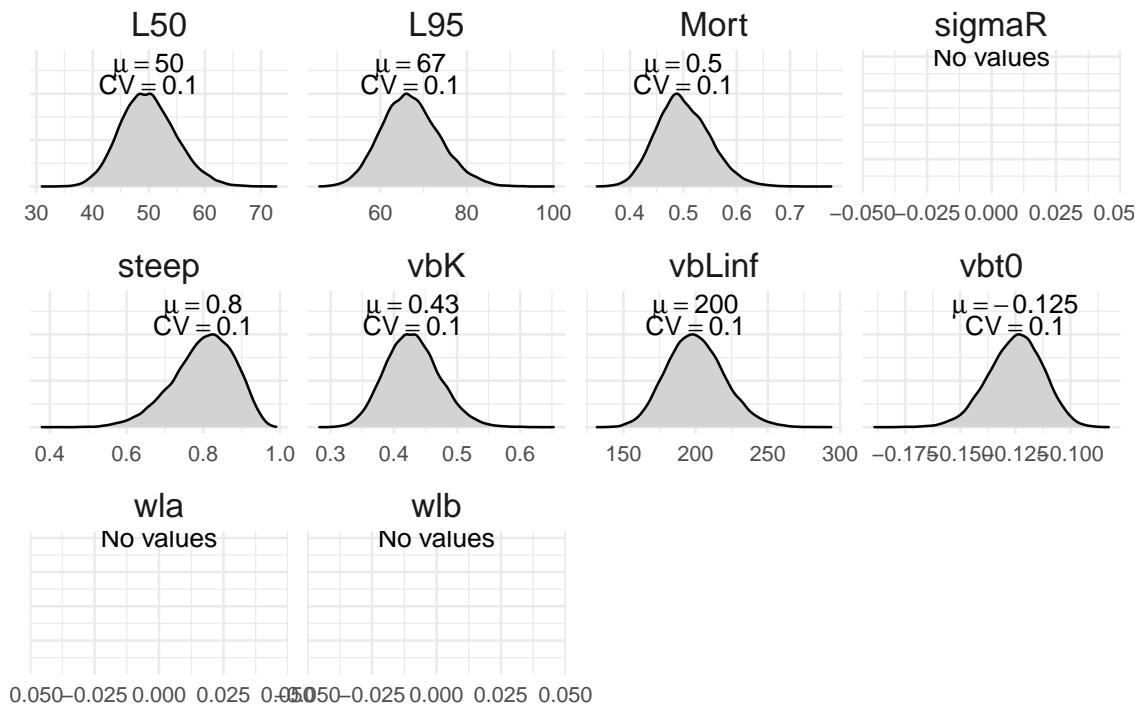
Figure 1. Density plots of biological parameters

L50	L95	Mort	sigmaR
$\mu = 50$ $CV = 0.1$	$\mu = 67$ $CV = 0.1$	$\mu = 0.5$ $CV = 0.1$	No values

30 40 50 60 70   60 80 100   0.4 0.5 0.6 0.7   −0.050 −0.025 0.000 0.025 0.05

steep	vbK	vbLinf	vbt0
$\mu = 0.8$ $CV = 0.1$	$\mu = 0.43$ $CV = 0.1$	$\mu = 200$ $CV = 0.1$	$\mu = -0.125$ $CV = 0.1$

0.4 0.6 0.8 1.0 0.3 0.4 0.5 0.6 150 200 250 300 −0.175 −0.150 −0.125 −0.100

wla	wlb
No values	No values

0.050 −0.025 0.000 0.025 0.050   −0.050 −0.025 0.000 0.025 0.050

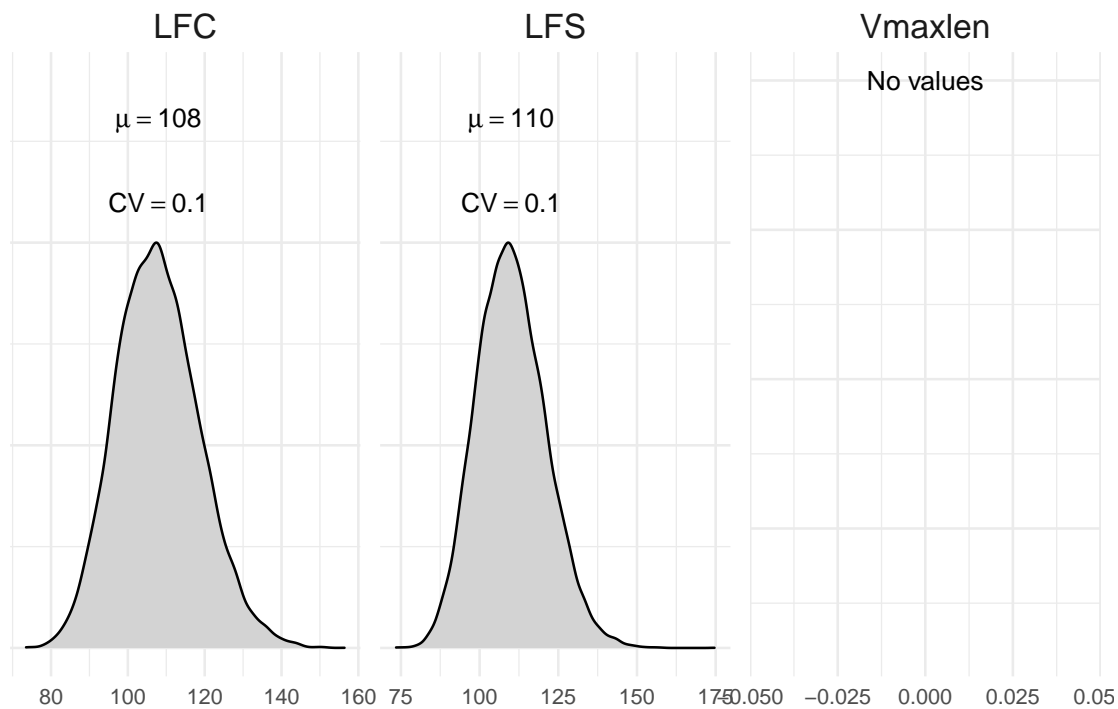## Figure 2. Distribution of length−at−age

Mean length−at−age (solid line) and 2 standard deviations (shaded region)

LenCV = 0.1
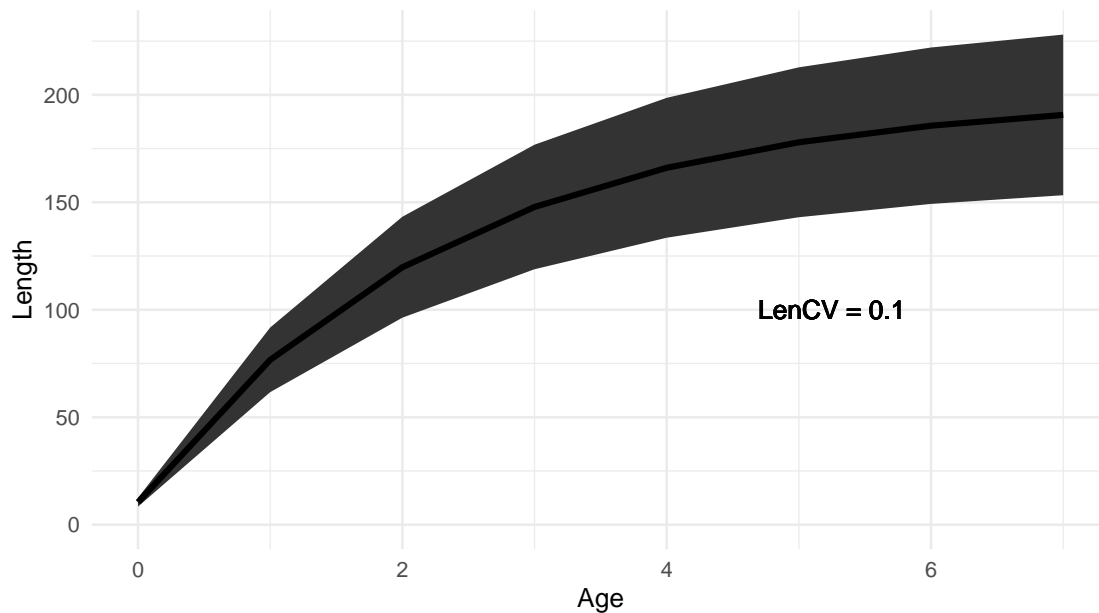
Selectivity

Length at first capture was set to the minimul legal size and length at full selection slightly above it.

Figure 3. Density plots of selectivity parameters

Time-Series

Catch is represented by the total pounds landed of all three species combined annually. Effort is partially represented by the number of landing receipts submitted annually. This does not account for an observed but unquantified increase in trap use over time. The California spiny lobster fishery has a logbook which accounts for trap pulls. This was used to calculate a scalar of relative increase in lobster trap use over time which was applied to rock crab receipts.

Average catch over time is the average catch over the 44 years between 1975 and 2018.

Figure 4. Time–Series Data
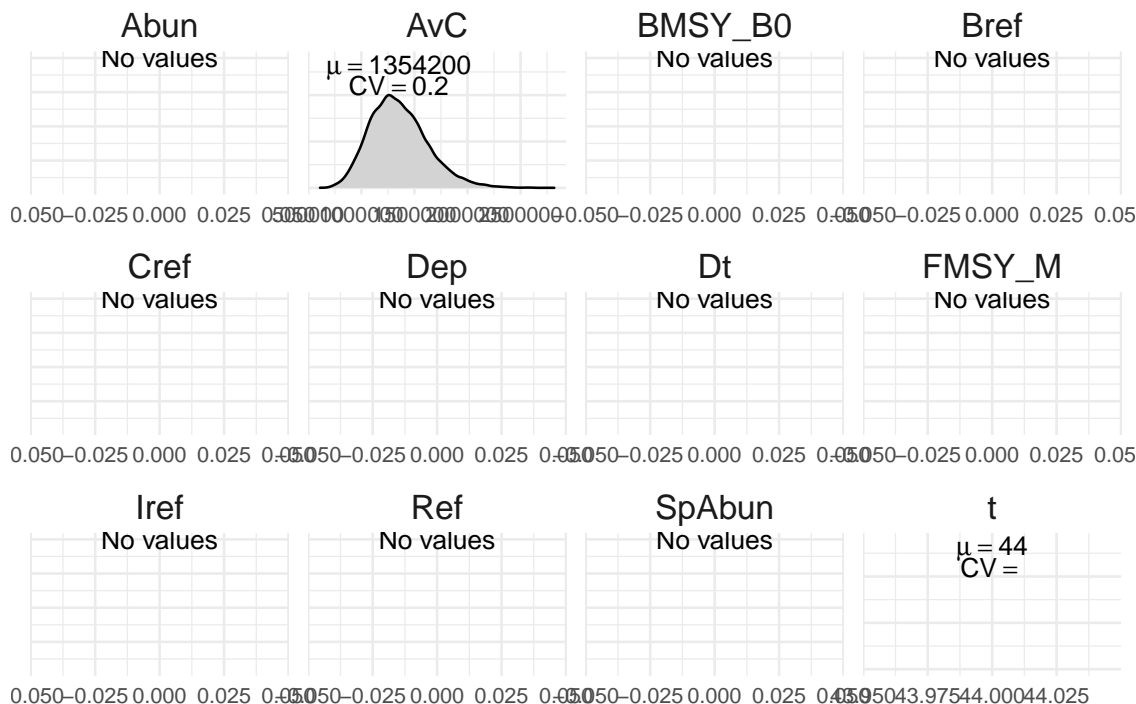

Catch (NA)
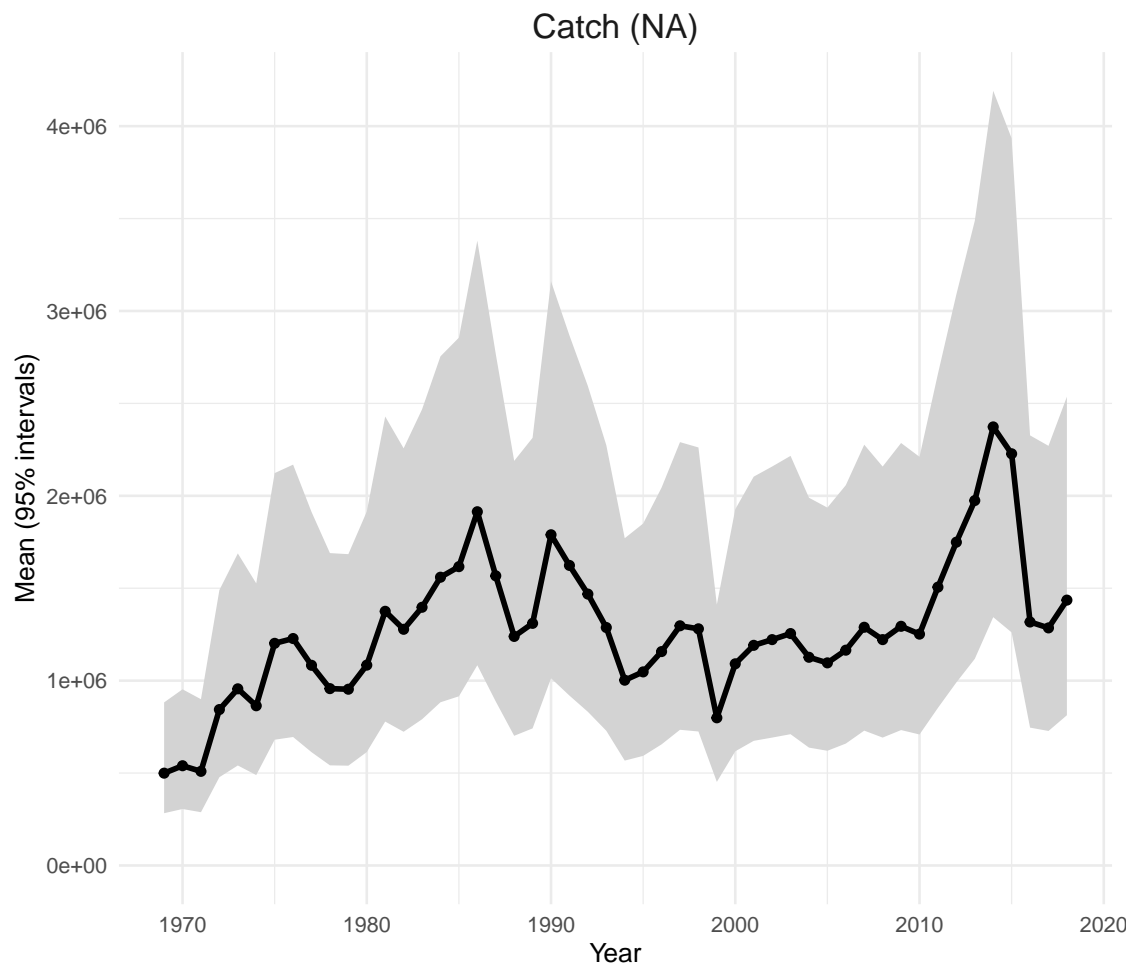
Catch-at-Age

No age information is available.

Catch-at-Length

Catch at leangth data is available only for a portion of the fleet in the years 2008 and 2018. These data were not used here.

Reference

Figure 6. Density plots of Reference parameters

Reference List

California Department of Fish and Game (CDFG). 2003. Status of the Fisheries Report: An Update Through 2003. Chapter 5 Rock Crabs. 47 p. Culver CS, Schroeter SC, Page HM, Dugan JE. 2010. Essential Fishery Information for Trap-Based Fisheries: Development of a Framework for Collaborative Data Collection. Marine and Coastal Fisheries 2(1): 98-114. *Orensanz JM. and Gallucci VF. 1988. Comparitive Study of Postlarval Life-History Schedules in Four Sympatric Species of Cancer (Decapoda: Brachyura: Cancridae). Journal of Crustacean Biology 8(2): 187.* Yamada SB, and Groth SD. 2016. Growth and longevity of the Red Rock crab Cancer productus (Randall 1840). Journal of shellfish research 35(4): 1045-1052.