

Temperature and Rainbow Trout Growth Rate

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Species Information

Common Name: Rainbow Trout
Genus: *Oncorhynchus mykiss*

Stressor Details

Stressor Name: Temperature
Units: °C
Metric: Tank Temperature
Scale: linear
Function Type: continuous
Vital Rate/Process: Growth

Life Stage & Context

Life Stages: Fry

Descriptions

Overview

Percent daily relative growth rate of juvenile westslope cutthroat trout in relation to temperature during a 60-d experiment. In this laboratory experiment, Rainbow trout were obtained as eggs from the Ennis National Fish Hatchery near Ennis, Montana.

Growth formula is as follows:

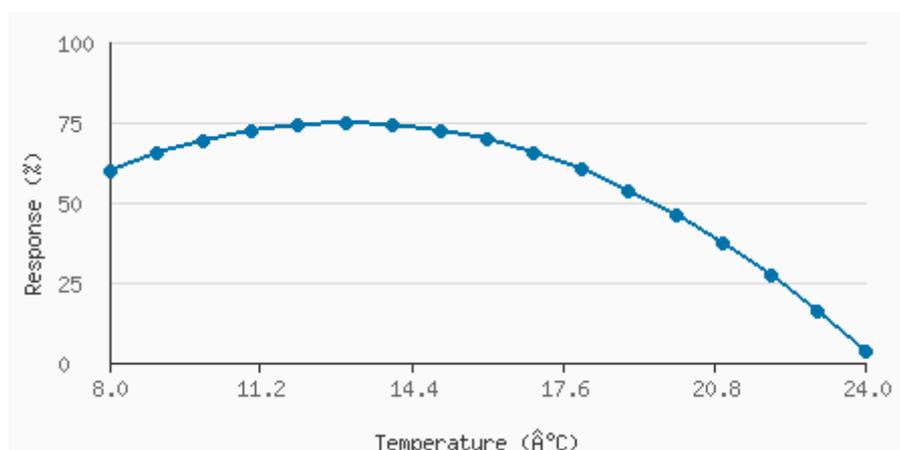
$$\text{Growth} = -0.7691 + 0.4514 * \text{temp} - 0.0173 * (\text{temp})^2$$

Scaled from the original curve so that the highest upper limit value equals to 100%.

Function Derivation

laboratory experiment

Stressor Response Data



Stressor (X)	Mean System Capacity (%)	SD	low.limit	up.limit
8	59.6185567	12.02749141	32.64604811	85.91065292
9	65.02405498	12.37113402	37.80068729	90.37800687

10	69.24054983	10.30927835	41.92439863	96.56357388
11	72.26804124	8.591065292	46.04810997	97.93814433
12	74.10652921	8.591065292	48.79725086	100
13	74.75601375	8.934707904	49.48453608	100
14	74.21649485	7.903780069	49.14089347	100
15	72.48797251	6.872852234	48.10996564	97.93814433
16	69.57044674	8.24742268	44.32989691	94.84536082
17	65.46391753	7.903780069	42.26804124	91.75257732
18	60.16838488	10.30927835	34.36426117	83.16151203
19	53.6838488	7.216494845	29.89690722	78.35051546
20	46.01030928	12.02749141	22.33676976	73.5395189
21	37.14776632	9.621993127	11.6838488	65.29209622
22	27.09621993	13.74570447	1.374570447	55.32646048
23	15.8556701	14.08934708	0	44.32989691
24	3.426116838	10.99656357	0	29.89690722

Citations

Bear, E. A., McMahon, T. E., & Zale, A. V. (2007). Comparative thermal requirements of westslope cutthroat trout and rainbow trout: implications for species interactions and development of thermal protection standards. *Transactions of the American Fisheries Society*, 136(4), 1118.

References

Bear et al. - <https://afspubs.onlinelibrary.wiley.com/doi/10.1577/T06-072.1>