

Supplement

Sea lice (*L. salmonis*) salinity thresholds (ranges rounded to nearest whole digit), by lice stage and time exposed, reported in various peer-reviewed field and experimental studies (Ljungfeldt et al. 2017, Crosbie et al. 2019, Groner et al. 2019, Sievers et al. 2019, and expert opinion (Melanie Andrews)). Light grey and regular font boxes refer to risk of mortality; darker grey and bold font boxes refer to tolerance and survival ability. If a box only has a letter referencing a footnote, it refers to a point-source (particular salinity ppt) information and not to a range of salinity. Each row refers to a different scenario (e.g., life stage, population susceptibility, time exposure, etc.) or to avoid overlapping boxes for better visualization. We used this information as data for our salinity and time subfactors, for the applicable life stages, for our example Visual PROMETHEE models.

Salinity (psu or ppt)																														
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
no hatching if < several days exposure																				eggs will hatch										
die if > several hours exposure															nauplii completely avoid															
> 1/2 free-swimming copepodids die in < 3 hours												pelagic larvae alive																		
																~10% copepodids alive														
copepodid development inhibited if < 30 psu (but may be reversible if short-term exposure)																														
< 1/2 of copepodids live in 24 hour exposure																							copepodids alive if more-susceptible population							
< 1/2 of copepodids live in 24 hour exposure												copepodids alive if less-susceptible population																		
transcriptional changes in copepodids																														
						a	attached lice alive																							
< 1/2 of preadults live in 24 hour exposure						preadult II alive if more-susceptible population																								
preadult II: none survive in one population in 24 hours, or < 30% of lice live in another population																														
b						non-attached adult females alive																								
																optimal survival of adults at 14-15 °C from 16 to > 27 psu														
																some individual lice alive														
c		d		e			f			g		h		i		j			k											

Note: 0 psu salinity = full freshwater (conversely, full seawater = 34 ppt)

^a mortality approximately 1 week at 7 psu

^b mortality at 0 psu in < 8 hours

^c adults and gravid females alive at 0 psu (freshwater) for several days

^d copepodids eliminated on 1 day post infection at <1 ppt for 1 to 3 hours

^e copepodids not able to attach during a 3-hour experiment at 4 ppt; exposure time affected attached (1-day post infection)

copepodid density and slower copepodid development (see Sievers et al., 2019, for details)

^f eggs aborted and died or severely impaired viability and decreased hatching at 11.5 psu

^g exposure time affected attached (1-day post infection) copepodid density and slower copepodid development (see Sievers et al.,

2019, for details)

^h on juvenile Pacific salmon, lice survived 14.46 +/- 2.29 days at 14 psu

ⁱ on juvenile Pacific salmon, lice had variable survival for 13 days at 15 psu

^j slower copepodid development (see Sievers et al., 2019, for details)

^k apoptosis in copepodids between 25-26 psu