**Appendix**

Table A1. Number of salmon lethally sampled at the end of the experiment (N) at each enclosure location. Numbers in parentheses denotes “placebo” fish stocked to keep the same number of fish per enclosure over the course of the experiment.

|  |  |  |
| --- | --- | --- |
| **Region** | **Location** | **N** |
| **Butte Sink** | BSW1 | 7 (3) |
| BSW2 | 10 (4) |
| BSC1 | 10 (4) |
| **Upper Bypass** | UBA1 | 10 (3) |
| UBW1 | 10 (2) |
| **Lower Bypass** | LBW1 | 10 (2) |
| LBA1 | 10 (1) |
| LBA2 | 10 (6) |
| **Sacramento River** | SRC1 | 9 (7) |
| SRC2 | 10 (4) |
| SRC3 | 8 (2) |
| SRC4 | 10 |
| **Feather River** | FRC1 | 9 (5) |

Table A2. Higher taxonomic units (HTUs) defined for ambient and gut invertebrate taxa.

|  |  |
| --- | --- |
| **HTU** | **Comment** |
| Amphipoda | Rare in pelagic invertebrate samples  |
| Cladocera |  |
| Copepoda |  |
| Insecta |  |
| Ostracoda |  |
| Rotifera | Rare in gut samples |

Table A3. Number of fish (Nfish) used for the mixed effect modelling at each location.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Enclosure** | **Nfish** | **Region** | **Type** |
| BSC1 | 1 | 3 | Butte Sink | Channel |
| BSC1 | 2 | 3 | Butte Sink | Channel |
| BSW2 | 1 | 3 | Butte Sink | Wetland |
| BSW2 | 2 | 3 | Butte Sink | Wetland |
| BSW1 | 1 | 3 | Butte Sink | Wetland |
| BSW1 | 2 | 4 | Butte Sink | Wetland |
| UBA1 | 1 | 4 | Upper Bypass | Agriculture |
| UBA1 | 2 | 3 | Upper Bypass | Agriculture |
| UBW1 | 1 | 4 | Upper Bypass | Wetland |
| UBW1 | 2 | 4 | Upper Bypass | Wetland |
| LBA1 | 1 | 4 | Lower Bypass | Agriculture |
| LBA1 | 2 | 5 | Lower Bypass | Agriculture |
| LBA2 | 1 | 4 | Lower Bypass | Agriculture |
| LBA2 | 2 | 0 | Lower Bypass | Agriculture |
| LBW1 | 1 | 4 | Lower Bypass | Wetland |
| LBW1 | 2 | 4 | Lower Bypass | Wetland |
| FRC1 | 1 | 4 | Feather River | Channel |
| FRC1 | 2 | 0 | Feather River | Channel |
| SRC3 | 1 | 3 | Sacramento River | Channel |
| SRC3 | 2 | 3 | Sacramento River | Channel |
| SRC1 | 1 | 2 | Sacramento River | Channel |
| SRC1 | 2 | 0 | Sacramento River | Channel |
| SRC2 | 1 | 4 | Sacramento River | Channel |
| SRC2 | 2 | 2 | Sacramento River | Channel |
| SRC4 | 1 | 5 | Sacramento River | Channel |
| SRC4 | 2 | 5 | Sacramento River | Channel |

Table A4. Paired t-test models (using *pairwise\_t\_test function* in R) showing the significance level of enclosure number (Group 1 and Group 2) on fish growth rates within a given location and time period. Bold numbers show p.value <0.05.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Period** | **Group 1** | **Group 2** | **p.value** |
| BSC1 | 1 | 2 | 1 | 0.30228 |
| BSC1 | 2 | 2 | 1 | 0.899142 |
| BSC1 | 3 | 2 | 1 | 0.101284 |
| BSW1 | 1 | 2 | 1 | 0.867487 |
| BSW1 | 2 | 2 | 1 | **0.024936** |
| BSW1 | 3 | 2 | 1 | 0.710055 |
| BSW2 | 1 | 2 | 1 | 0.760742 |
| BSW2 | 2 | 2 | 1 | 0.403661 |
| BSW2 | 3 | 2 | 1 | 0.797107 |
| LBA1 | 1 | 2 | 1 | 0.448304 |
| LBA1 | 2 | 2 | 1 | 0.859534 |
| LBA1 | 3 | 2 | 1 | 0.644203 |
| LBW1 | 1 | 2 | 1 | 0.28492 |
| LBW1 | 2 | 2 | 1 | 0.194838 |
| LBW1 | 3 | 2 | 1 | 0.727446 |
| SRC2 | 1 | 2 | 1 | 0.161052 |
| SRC2 | 2 | 2 | 1 | 0.720856 |
| SRC2 | 3 | 2 | 1 | 0.429621 |
| SRC3 | 1 | 2 | 1 | 0.826724 |
| SRC3 | 2 | 2 | 1 | 0.644658 |
| SRC3 | 3 | 2 | 1 | 0.394888 |
| SRC4 | 1 | 2 | 1 | 0.296462 |
| SRC4 | 2 | 2 | 1 | 0.192058 |
| SRC4 | 3 | 2 | 1 | 0.139593 |
| UBA1 | 1 | 2 | 1 | 0.689804 |
| UBA1 | 2 | 2 | 1 | 0.169484 |
| UBA1 | 3 | 2 | 1 | 0.459733 |
| UBW1 | 1 | 2 | 1 | 0.716446 |
| UBW1 | 2 | 2 | 1 | **0.010208** |
| UBW1 | 3 | 2 | 1 | 0.256038 |

Table A5. Best mixed effect model’s parameter mean estimates and confidence intervals (CI).

**SGR**

*Predictors Estimates CI*

|  |  |  |
| --- | --- | --- |
| (Intercept) | 0.82 | 0.18 – 1.46 |
| NMDS2 | -0.72 | -1.31 – -0.14 |
| sdTemp | 0.56 | 0.07 – 1.04 |
| meanCHL | 0.22 | 0.11 – 0.32 |
| NMDS2 \* sdTemp | -0.02 | -0.50 – 0.46 |
| NMDS2 \* meanCHL | 0.10 | -0.02 – 0.22 |
| sdTemp \* meanCHL | -0.03 | -0.11 – 0.05 |
| (NMDS2 \* sdTemp) \* meanCHL | -0.00 | -0.12 – 0.12 |
| **Random Effects** |  |  |
| σ2 | 0.59 |  |
| τ00 PIT | 0.00 |  |
| τ00 Location | 0.22 |  |
| N Location | 13 |  |
| N PIT | 83 |  |

Observations 249

Marginal R2 / Conditional R2 0.509 / NA



Figure A1. Pearson coefficient (r) between environmental factors considered in mixed effect models

Figure A2. Continuous dissolved oxygen (DO) and water temperature grouped by region and colored by habitat type.

Figure A3. Electrical conductivity (EC), salinity (Sal), pH, turbidity (Turb), chlorophyll a (CHL), and blue-green algae (BGA) stack plot, grouped by region and colored by habitat type. Each line shows the factor values for each monitored enclosure.

Figure A4. Boxplot of ambient pelagic invertebrate log-abundance grouped by HTU (see Table A2 for list of HTUs) for each habitat type and bi-weekly time period, with period 1 = weeks 1 & 2, period 2 = weeks 3 & 4, and period 3 = weeks 5 & 6 of the experiment.