

Supplementary Material

Vertical distribution patterns of ichthyoplankton in temperate waters of New Zealand

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Table S1. Design A – depth stratified temperature data (°C), collected with a closing water bottle; shallow (20 m), deep (40 m).

| Site | A | B | C | D |
|----------------|------|------|------|------|
| December 1984 | | | | |
| Rodney shallow | 20.1 | 19.8 | 19.3 | 18.9 |
| Rodney Deep | 18.9 | 18.2 | 17.9 | 17.9 |
| Omaha shallow | 20.4 | 19.5 | 19.2 | 19.2 |
| Omaha deep | 19.1 | 19 | 18.9 | 18.5 |
| Kawau shallow | 19.5 | 19 | 18.6 | 18.4 |
| Kawau deep | 20 | 19.4 | 19 | 17 |
| January 1985 | | | | |
| Rodney shallow | 22.7 | 22.1 | 21.2 | 21.0 |
| Rodney Deep | ND | ND | ND | ND |
| Omaha shallow | 23.1 | 23 | 22.5 | 21.5 |
| Omaha deep | 21.9 | 19.1 | 18.0 | 17.5 |
| Kawau shallow | 22.3 | 22 | 21.7 | 20.5 |
| Kawau deep | 22 | 20.2 | 18.5 | 18.5 |

The position of a temperature change between two strata that was greater than 1°C is shaded.

Table S2. Design B – *Engraulis australis*, *Trachurus* spp., *Chrysophrys auratus*, *Scomber australasicus*.

| Depth | Day | <i>E. australis</i> | <i>Trachurus</i> spp. | <i>C. auratus</i> | <i>S. australasicus</i> |
|--------------|-----|---------------------|-----------------------|-------------------|-------------------------|
| Surface | 1 | 38 (27) | 19 (27) | 0 (0) | 2 (1) |
| | 2 | 1 (1) | 23 (9) | 0 (0) | 1 (1) |
| | 3 | 19 (4) | 26 (5) | 1 (1) | 4 (2) |
| Near-surface | 1 | 270 (128) | 152 (81) | 10 (4) | 10 (2) |
| | 2 | 268 (191) | 50 (14) | 7 (2) | 21 (9) |
| | 3 | 330 (84) | 142 (46) | 17 (5) | 11 (7) |
| Mid depth | 1 | 330 (84) | 267 (116) | 12 (4) | 35 (6) |
| | 2 | 324 (113) | 423 (161) | 19 (8) | 74 (21) |
| | 3 | 264 (146) | 1322 (118) | 26 (22) | 31 (7) |
| Deep | 1 | 133 (22) | 956 (261) | 9 (3) | 19 (9) |
| | 2 | 226 (76) | 830 (248) | 25 (6) | 38 (11) |
| | 3 | 140 (83) | 1264 (387) | 8 (6) | 14 (11) |

Mean (s.e.) densities of fish captured in four 5-m depth strata over three consecutive days at Kawau Island, in 20-m water column, February 1986. Depth Surface, 0–5 m; Near surface, 5–10 m; Mid depth, 10–15 m;

Deep, 15–20 m. Densities are expressed as numbers per 500 m³, 0.475-mm mesh net.

Table S3. PERMANOVA testing for differences in larval assemblages between day and night in different depth strata, these results are from 999 permutations.

| Source | d.f. | MS | Pseudo- <i>F</i> | <i>P</i> _{perm} |
|----------------|------|--------|------------------|--------------------------|
| Diel | 1 | 4019.9 | 10.148 | 0.001 |
| Depth | 3 | 1200.6 | 3.031 | 0.007 |
| Shallow | 1 | 1222.8 | 2.914 | 0.047 |
| Diel × Depth | 3 | 950.67 | 2.4 | 0.032 |
| Diel × Shallow | 1 | 2246.9 | 5.35 | 0.004 |
| Residual | 56 | 396.04 | | |
| Total | 63 | | | |

Table S4. Analysis of dissimilarity for surface strata day and night, the average dissimilarity between day and night was 82.29%.

| Species | Group Day | Group Night | Mean dissimilarity | Dissimilarity s.d. | Percentage contribution | Cumulative percentage |
|------------------|----------------|----------------|--------------------|--------------------|-------------------------|-----------------------|
| | Mean abundance | Mean abundance | | | | |
| <i>Engraulis</i> | 0.64 | 5.41 | 38.99 | 2.04 | 47.38 | 47.38 |
| <i>Trachurus</i> | 0.91 | 3.07 | 18.57 | 1.91 | 22.57 | 69.95 |
| <i>Sardinops</i> | 0 | 1.99 | 11.64 | 1.26 | 14.15 | 84.10 |