Data analysis

*Effect sizes*

For tidal wetland area, predictions were made at the minimum (0.0 km2) and maximum (4.89 km2) level in the dataset (Table S1). Temperature and time of collection were held constant at their means to make these predictions. Because 94% of Delta Smelt were collected at turbidities below 80 NTU, turbidity was held constant at <80 NTU. Predictions were made for all three surveys (STN, FMWT, SKT) and both levels of salinity (fresh and brackish) and back-transformed to stomach fullness (%). The six results calculated at the minimum level of tidal wetland area were averaged, as well as at the maximum level of tidal wetland area. Predictions were also made for turbidity using this method, except tidal wetland area was held constant at its mean and turbidity varied between <80 and >80 NTU. Finally, the same methodology was used for temperature, which ranged from 7.4 to 25.5°C (tidal wetland area was held constant at its mean, and turbidity was <80 NTU). Model predictions were made using the ‘predict’ function in R.

Table S1 Tidal wetland areas and Delta Smelt catch by station for the dataset used in this paper (n = 1380).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Station | Delta Smelt | Tidal wetland (km2) | Station | Delta Smelt | Tidal wetland (km2) |
| 340 | 3 | 0.2093 | 602 | 43 | 0.0145 |
| 405 | 2 | 0.2448 | 603 | 1 | 0.5715 |
| 407 | 1 | 0.6320 | 605 | 2 | 0.7615 |
| 411 | 10 | 1.8904 | 606 | 111 | 0.6641 |
| 412 | 2 | 1.3404 | 609 | 121 | 1.5941 |
| 413 | 3 | 1.4681 | 610 | 18 | 0.0708 |
| 416 | 1 | 1.8570 | 701 | 1 | 2.3079 |
| 417 | 1 | 1.7840 | 703 | 27 | 0.6521 |
| 418 | 5 | 1.0979 | 704 | 81 | 0.0893 |
| 501 | 17 | 2.4142 | 705 | 26 | 0.0244 |
| 502 | 3 | 2.2425 | 706 | 87 | 0.0645 |
| 503 | 3 | 1.4190 | 707 | 27 | 0.0949 |
| 504 | 8 | 1.4022 | 711 | 3 | 0.0707 |
| 505 | 2 | 1.7821 | 712 | 3 | 0.0125 |
| 507 | 30 | 3.4413 | 713 | 23 | 0.0010 |
| 508 | 20 | 2.8266 | 715 | 42 | 0.1515 |
| 509 | 4 | 1.7667 | 716 | 77 | 0.1940 |
| 510 | 2 | 1.6994 | 719 | 214 | 1.7805 |
| 511 | 2 | 1.8515 | 721 | 30 | 0.1157 |
| 512 | 6 | 1.2088 | 723 | 1 | 0.1916 |
| 513 | 46 | 1.5500 | 796 | 1 | 0.0025 |
| 515 | 7 | 3.4867 | 797 | 73 | 0.0000 |
| 516 | 2 | 2.1430 | 801 | 22 | 4.8949 |
| 517 | 9 | 0.7196 | 802 | 1 | 4.2347 |
| 518 | 18 | 0.7614 | 804 | 13 | 2.5151 |
| 519 | 98 | 0.6647 | 806 | 1 | 0.4871 |
| 520 | 23 | 3.0763 | 807 | 2 | 0.4070 |
| 601 | 1 | 0.9305 |   |   |   |

Table S2 Percentage by wet weight of prey categories found in stomachs of Delta Smelt collected by California Department of Fish and Wildlife studies between August 2011 and August 2015. Unidentified animal material, plant material, and debris were not included because enumeration of these items was not possible. Fields ≥5% highlighted in green. \**Americorophium stimpsoni* and *A. spinicorne* constitute majority of Corophium body type amphipods found in stomachs.



Table S3 Parameter estimates and 95% confidence intervals for Model #10 (Table 1)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Estimate | 2.50% | 97.50% |
| Intercept | 0.0077256 | -0.005014232 | 0.020465479 |
| Tidal wetland area | 0.0044578 | 0.002742127 | 0.006173522 |
| Time of day | 0.0034683 | 0.002606771 | 0.004329889 |
| SKT | 0.0019195 | -0.004513635 | 0.008352691 |
| STN | -0.0284288 | -0.036471983 | -0.020385651 |
| Salinity (fresh) | -0.0235961 | -0.030958182 | -0.016233942 |
| Turbidity (>80) | -0.0285134 | -0.035864553 | -0.021162256 |
| Temperature | 0.0016311 | 0.001043486 | 0.002218644 |
| Survey × Salinity (SKT × fresh) | 0.0066789 | -0.002396533 | 0.01575428 |
| Survey × Salinity (STN × fresh) | 0.0361660 | 0.026051989 | 0.046279998 |

Table S4 Comparison of stomach fullness models in which Delta Smelt with larval fish in their guts were excluded. ‘Tw’ is tidal wetland area (km2), ‘Hr’ is time of day divided into two hour blocks, ‘Surv’ is survey (STN, FMWT, and SKT), ‘Sal’ is salinity (fresh or brackish), ‘Turb2’ is turbidity divided into two bins (<80 and >80 NTU), ‘Turb3’ is turbidity divided among three bins (<12, >12 and <80, and >80 NTU), ‘Turb’ is turbidity as a continuous variable, and ‘Temp’ is water temperature in °C. Proportion stomach fullness was arcsin square-root transformed.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model # | Model | ΔAICc | df | AICc wt |
| 10 | ~Tw + Hr + Surv + Sal + Sal × Surv + Turb2 + Temp | 0 | 11 | 0.9 |
| 11 | ~Hr + Surv + Sal + Sal × Surv + Turb2 + Temp | 4.3 | 10 | 0.1 |
| 7 | ~Tw + Hr + Surv + Sal + Sal × Surv + Turb3  | 28.4 | 11 | <0.001 |
| 8 | ~Tw + Hr + Surv + Sal + Sal × Surv + Turb2  | 31.4 | 10 | <0.001 |
| 9 | ~Hr + Surv + Sal + Sal × Surv + Turb2  | 43.7 | 9 | <0.001 |
| 6 | ~Tw + Hr + Surv + Sal + Sal × Surv + Turb | 50.5 | 10 | <0.001 |
| 5 | ~Tw + Hr + Surv + Sal + Sal × Surv | 68.2 | 9 | <0.001 |
| 4 | ~Hr + Surv + Sal + Sal × Surv | 85.2 | 8 | <0.001 |
| 3 | ~Tw + Hr + Surv + Sal | 131.6 | 7 | <0.001 |
| 2 | ~Hr + Surv + Sal | 143 | 6 | <0.001 |
| 1 | ~Intercept only | 266.1 | 2 | <0.001 |

*ΔAICc* difference between model of interest and top-ranked model in Akaike Information Criterion Units corrected for small sample size *df* degrees of freedom, *AICc wt* Akaike weight

Table S5 Parameter estimates and 95% confidence intervals for Model #10 (i.e., Delta Smelt with larval fish in guts excluded; Table S4)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Estimate | 2.50% | 97.50% |
| Intercept | 0.005297 | -0.006015676 | 0.01660931 |
| Tidal wetland area | 0.002423 | 0.000857622 | 0.003988268 |
| Time of day | 0.004098 | 0.003330787 | 0.004864741 |
| SKT | -0.005810 | -0.011567572 | -0.00005065 |
| STN | -0.026990 | -0.034108951 | -0.01987486 |
| Salinity (fresh) | -0.023260 | -0.029731713 | -0.01679593 |
| Turbidity (>80) | -0.020900 | -0.027007629 | -0.01479454 |
| Temperature | 0.001445 | 0.000924053 | 0.001965272 |
| Survey × Salinity (SKT × fresh) | 0.01409 | 0.006096422 | 0.02208319 |
| Survey × Salinity (STN × fresh) | 0.035747 | 0.026824546 | 0.04466919 |

Table S6 Parameter estimates and 95% confidence intervals for Model #2 (Table 2)

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Estimate | 2.50% | 97.50% |
| Intercept | 0.013608 | -0.01299 | 0.040210 |
| Tidal wetland area | 0.006716 | 0.00287 | 0.010562 |
| Time of day | 0.003208 | 0.001547 | 0.004869 |
| STN | -0.043002 | -0.05712 | -0.028890 |
| Salinity (fresh) | -0.027090 | -0.03831 | -0.015870 |
| Turbidity (>80) | -0.040480 | -0.05684 | -0.024120 |
| Temperature | 0.001993 | 0.000508 | 0.003478 |
| Survey × Salinity (stn × fresh) | 0.042789 | 0.028785 | 0.056793 |