# SUPPORTING INFORMATION

# Floodplain trophic subsidies in a modified river network: Managed foodscapes of the future?

Table S1. Site coordinates and capture regions colored to match those used in Fig. 1, showing river distance in river kilometers (rkm) from the Yolo Bypass outlet (Sacramento River [SAC] basin) and Cosumnes River [COS] floodplain outlet (San Joaquin River [SJR] basin) to each capture site (Fig. 8). Gear types: SEIN = 15 m beach seine, KDTR = Kodiak trawl, MWT = midwater trawl.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Station** | **Gear** | **Site code (Fig. 1)** | **Site name** | **Latitude (DD)** | **Longitude (DD)** | **Region** | **Upstream /downstream of floodplain outlet** | **rkm below COS** | **rkm below Yolo** |
| SR055E | SEIN | SH | Sherwood Harbor | 38.52638986 | -121.5279611 | Lower Sacramento | Upstream |  |  |
| SR055M | KDTR /MWT | SH | Sherwood Harbor | 38.53278804 | -121.5233336 | Lower Sacramento | Upstream |  |  |
| SR049E | SEIN | GB | Garcia Bend | 38.47563125 | -121.5418676 | Lower Sacramento | Upstream |  |  |
| SR043W | SEIN | CL | Clarksburg | 38.38291834 | -121.5208793 | Lower Sacramento | Upstream |  |  |
| SS011N | SEIN | SS | Steamboat Slough | 38.30460903 | -121.5748618 | Lower Sacramento | Upstream |  |  |
| SR024E | SEIN | KO | Koket | 38.24046854 | -121.5547133 | Lower Sacramento | Upstream |  |  |
| SR017E | SEIN | IS | Isleton | 38.16272446 | -121.6115635 | Lower Sacramento | Upstream |  |  |
| SR014W | SEIN | RV | Rio Vista | 38.18462753 | -121.6615231 | Yolo runoff | Downstream (SAC) |  | 22.5 |
| SR012W | SEIN | SB | Sandy Beach | 38.1392055 | -121.6950223 | Yolo runoff | Downstream (SAC) |  | 30.3 |
| MS001N | SEIN | SI | Sherman Island | 38.05412097 | -121.784866 | West Delta | Downstream (SAC) |  | 48.7 |
| SB018X | MWT | CI | Chipps Island | 38.04365479 | -121.9112847 | Chipps Island | Downstream (SAC) |  | 60.8 |
| SJ063W | SEIN | BB | Big Beach | 37.72359418 | -121.2962159 | Lower San Joaquin | Upstream |  |  |
| SJ056E | SEIN | MO | Mossdale | 37.78533934 | -121.3063476 | Lower San Joaquin | Upstream |  |  |
| SJ054M | KDTR | MO | Mossdale | 37.80564933 | -121.3156297 | Lower San Joaquin | Upstream |  |  |
| SJ051E | SEIN | DR | Dos Reis | 37.82827412 | -121.31015 | Lower San Joaquin | Upstream |  |  |
| SJ074W | SEIN | SB | Sturgeon Bend | 37.67227165 | -121.244883 | Lower San Joaquin | Upstream |  |  |
| SF014E | SEIN | WI | Wimpy's | 38.22524194 | -121.4906176 | Cosumnes runoff | Downstream (SJR) | 18.0 |  |
| MK004W | SEIN | BW | B&W Marina | 38.12564164 | -121.5793298 | Cosumnes runoff | Downstream (SJR) | 39.8 |  |
| LP003E | SEIN | TE | Terminous | 38.10995862 | -121.5002135 | Cosumnes runoff | Downstream (SJR) | 40.2 |  |
| SJ005N | SEIN | ED | Eddo's | 38.04902171 | -121.6983803 | West Delta | Downstream (SJR) | 67.3 |  |
| SJ001S | SEIN | AD | Antioch Dunes | 38.01482461 | -121.7828837 | West Delta | Downstream (SJR) | 78.3 |  |

Table S2. Sample sizes (incl. fish with empty stomachs used in Index of Fullness calculations) by region and year (2014-15 pooled due to low sample sizes within year and identical inundation periods)

|  |  |  |
| --- | --- | --- |
| Year | Region | N fish |
| 2014-15 | Chipps Island | 513 |
| 2014-15 | Cosumnes runoff | 26 |
| 2014-15 | Lower Sacramento | 104 |
| 2014-15 | Lower San Joaquin | 196 |
| 2014-15 | West Delta | 38 |
| 2014-15 | Yolo runoff | 37 |
| 2016 | Chipps Island | 235 |
| 2016 | Cosumnes runoff | 40 |
| 2016 | Lower Sacramento | 213 |
| 2016 | Lower San Joaquin | 24 |
| 2016 | West Delta | 10 |
| 2016 | Yolo runoff | 15 |
| 2017 | Chipps Island | 130 |
| 2017 | Cosumnes runoff | 63 |
| 2017 | Lower Sacramento | 254 |
| 2017 | Lower San Joaquin | 268 |
| 2017 | West Delta | 31 |
| 2017 | Yolo runoff | 55 |
| 2018 | Chipps Island | 355 |
| 2018 | Cosumnes runoff | 13 |
| 2018 | Lower Sacramento | 231 |
| 2018 | Lower San Joaquin | 157 |
| 2018 | West Delta | 8 |
| 2018 | Yolo runoff | 17 |
|  | TOTAL | 3033 |

Table S3. Total number of prey items identified in this study and the mean dry weight (DW) applied (as per the grouping specified in column 2). Most weights were estimated as part of this study, some were provided by Cramer Fish Sciences (CFS) and some were obtained from the literature. Figures referenced in DW source refer to the figure numbers used in the specified source (not the current study). Life stages are indicated by letters (\_A = adult, \_N = nymph, \_L = larva, \_P = pupa). Terrestrial forms indicated by \_terr and/or ‘Y’ in the ‘Terrestrial’ column. Seven individuals (last two rows) were excluded due to lack of taxonomic resolution.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Taxa\_life stage identified | Taxa\_life stage grouping used | Phylum | Class | Sub-class | Order | Sub-order | Family | Terrestrial | Mean DW per individual (g) | DW source | Total N |
| Amphipoda\_A | Amphipoda\_other\_A | Arthropoda | Malacostraca |  | Amphipoda |  |  |  | 0.00082 | This study | 2356 |
| Corophiidae\_A | Corophiidae\_A | Arthropoda | Malacostraca |  | Amphipoda |  | Corophiidae |  | 0.00093 | This study | 8482 |
| Arachnida\_A | Araneae\_A | Arthropoda | Arachnida |  | Araneae |  |  | Y | 0.00059 | This study | 222 |
| Araneae\_A | Araneae\_A | Arthropoda | Arachnida |  | Araneae |  |  | Y | 0.00059 | This study | 235 |
| Isoptera\_A | Isoptera\_A | Arthropoda | Insecta |  | Blattodea | Isoptera |  | Y | 0.001 | Matsuura 2006 (https://doi.org/10.1603/0013-8746(2006)99[625:EEOMIT]2.0.CO;2) [Midpoint of Fig. 1] | 1 |
| Branchiopoda\_A | Cladocera\_A | Arthropoda | Branchiopoda |  | Cladocera |  |  |  | 0.0005 | This study | 1 |
| Chydoridae\_A | Cladocera\_A | Arthropoda | Branchiopoda |  | Cladocera |  |  |  | 0.0005 | This study | 165 |
| Cladocera\_A | Cladocera\_A | Arthropoda | Branchiopoda |  | Cladocera |  |  |  | 0.0005 | This study | 26437 |
| Carabidae\_A | Coleoptera\_A | Arthropoda | Insecta |  | Coleoptera |  |  |  | 0.00086 | This study | 1 |
| Coleoptera\_A | Coleoptera\_A | Arthropoda | Insecta |  | Coleoptera |  |  |  | 0.00086 | This study | 216 |
| Dytiscidae\_A | Coleoptera\_A | Arthropoda | Insecta |  | Coleoptera |  |  |  | 0.00086 | This study | 1 |
| Hydraenidae\_A | Coleoptera\_A | Arthropoda | Insecta |  | Coleoptera |  |  |  | 0.00086 | This study | 1 |
| Staphylinidae\_A | Coleoptera\_A\_terr | Arthropoda | Insecta |  | Coleoptera |  |  | Y | 0.00086 | This study | 2 |
| Coleoptera\_L | Coleoptera\_L | Arthropoda | Insecta |  | Coleoptera |  |  |  | 0.00102 | This study | 91 |
| Dytiscidae\_L | Coleoptera\_L | Arthropoda | Insecta |  | Coleoptera |  |  |  | 0.00102 | This study | 12 |
| Elmidae\_A | Coleoptera\_L | Arthropoda | Insecta |  | Coleoptera |  |  |  | 0.00102 | This study | 1 |
| Elmidae\_L | Coleoptera\_L | Arthropoda | Insecta |  | Coleoptera |  |  |  | 0.00102 | This study | 1 |
| Gyrinidae\_L | Coleoptera\_L | Arthropoda | Insecta |  | Coleoptera |  |  |  | 0.00102 | This study | 1 |
| Collembola\_A | Collembola\_A | Arthropoda | Entognatha |  | Collembola |  |  |  | 0.00038 | This study | 565 |
| Cumacea\_A | Cumacea\_A | Arthropoda | Malacostraca |  | Cumacea |  |  |  | 0.00054 | This study | 1480 |
| Decapoda\_L | Decapoda\_L | Arthropoda | Malacostraca |  | Decapoda |  |  |  | 0.06213 | Benke 1999 regression [Assumed a carapace length of 10mm (~midpoint of CFS lengths)] | 15 |
| Ceratopogonidae\_L | Ceratopogonidae\_L | Arthropoda | Insecta |  | Diptera |  | Ceratopogonidae | | 0.00006 | Linley, J. R. (1985). Growth and Survival of Culicoides Melleus Larvae (Diptera: Ceratopogonidae) on Four Prey Organisms. Journal of Medical Entomology, 22(2), 178-189. doi:10.1093/jmedent/22.2.178 [midpoint of Fig 4] | 44 |
| Chaoboridae\_L | Chironomidae\_L | Arthropoda | Insecta |  | Diptera |  | Chironomidae |  | 0.0005 | This study | 2 |
| Chironomidae\_L | Chironomidae\_L | Arthropoda | Insecta |  | Diptera |  | Chironomidae |  | 0.0005 | This study | 4579 |
| Culicidae\_L | Culicidae\_L | Arthropoda | Insecta |  | Diptera |  | Culicidae | Y | 0.00044 | This study | 13 |
| Ceratopogonidae\_A | Diptera\_other\_A | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00053 | This study | 1 |
| Chironomidae\_A | Diptera\_other\_A | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00053 | This study | 156 |
| Culicidae\_A | Diptera\_other\_A | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00053 | This study | 2 |
| Diptera\_A | Diptera\_other\_A | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00053 | This study | 8071 |
| Tipulidae\_A | Diptera\_other\_A | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00053 | This study | 1 |
| Diptera\_L | Diptera\_other\_L | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00062 | This study | 692 |
| Empididae\_L | Diptera\_other\_L | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00062 | This study | 1 |
| Tabanidae\_L | Diptera\_other\_L | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00062 | This study | 1 |
| Cecidomyiidae\_P | Diptera\_other\_P | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00065 | This study | 1 |
| Chironomidae\_P | Diptera\_other\_P | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00065 | This study | 36 |
| Diptera\_P | Diptera\_other\_P | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00065 | This study | 14458 |
| Empididae\_P | Diptera\_other\_P | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00065 | This study | 1 |
| Simuliidae\_P | Diptera\_other\_P | Arthropoda | Insecta |  | Diptera |  |  |  | 0.00065 | This study | 35 |
| Simuliidae\_L | Simuliidae\_L | Arthropoda | Insecta |  | Diptera |  | Simuliidae |  | 0.0002 | Wotton, R. S. (1980). Bacteria as food for blackfly larvae (Diptera: Simuliidae) in a lake-outlet in Finland. Annales Zoologici Fennici, 17(2), 127-130. [based on the mean DW (estimated from body length) of Simuliidae] | 47 |
| Syrphidae\_L | Syrphidae\_L | Arthropoda | Insecta |  | Diptera |  | Syrphidae |  | 0.00342 | Barlow, C.A., 1979 ENERGY UTILIZATION BY LARVAE OF A FLOWER FLY, SYRPHUS COROLLAE (DIPTERA: SYRPHIDAE). The Canadian Entomologist 111, 897-904. [Table 2 averaged DW for each age] | 1 |
| Ephemeroptera\_A | Ephemeroptera\_A | Arthropoda | Insecta |  | Ephemeroptera | |  |  | 0.00025 | Cramer Fish Sciences | 62 |
| Baetidae\_N | Ephemeroptera\_N | Arthropoda | Insecta |  | Ephemeroptera | |  |  | 0.00068 | This study | 7 |
| Ephemeroptera\_N | Ephemeroptera\_N | Arthropoda | Insecta |  | Ephemeroptera | |  |  | 0.00068 | This study | 325 |
| Heptageniidae\_N | Ephemeroptera\_N | Arthropoda | Insecta |  | Ephemeroptera | |  |  | 0.00068 | This study | 1 |
| Aphididae\_A | Aphididae\_A | Arthropoda | Insecta |  | Hemiptera |  | Aphididae | Y | 0.0005 | This study | 1988 |
| Aphididae\_N | Aphididae\_N | Arthropoda | Insecta |  | Hemiptera |  | Aphididae | Y | 0.00025 | Greenslade, A.F.C., et al 2016. Triticum monococcum lines with distinct metabolic phenotypes and phloem-based partial resistance to the bird cherry-oat aphid Rhopalosiphum padi. The Annals of applied biology 168, 435-449. | 455 |
| Corixidae\_A | Corixidae\_A\_N | Arthropoda | Insecta |  | Hemiptera |  | Corixidae |  | 0.00111 | This study | 350 |
| Corixidae\_N | Corixidae\_A\_N | Arthropoda | Insecta |  | Hemiptera |  | Corixidae |  | 0.00111 | This study | 39 |
| Hemiptera\_A | Hemiptera\_other\_A | Arthropoda | Insecta |  | Hemiptera |  |  |  | 0.00068 | This study | 2064 |
| Notonectidae\_A | Hemiptera\_other\_A | Arthropoda | Insecta |  | Hemiptera |  |  |  | 0.00068 | This study | 2 |
| Cicadellidae\_A | Hemiptera\_other\_A\_terr | Arthropoda | Insecta |  | Hemiptera |  |  | Y | 0.00068 | This study | 1 |
| Cicadidae\_A | Hemiptera\_other\_A\_terr | Arthropoda | Insecta |  | Hemiptera |  |  | Y | 0.00068 | This study | 22 |
| Cimicidae\_A | Hemiptera\_other\_A\_terr | Arthropoda | Insecta |  | Hemiptera |  |  | Y | 0.00068 | This study | 5 |
| Miridae\_A | Hemiptera\_other\_A\_terr | Arthropoda | Insecta |  | Hemiptera |  |  | Y | 0.00068 | This study | 1 |
| Psyllidae\_A | Hemiptera\_other\_A\_terr | Arthropoda | Insecta |  | Hemiptera |  |  | Y | 0.00068 | This study | 12 |
| Hemiptera\_N | Hemiptera\_other\_N | Arthropoda | Insecta |  | Hemiptera |  |  |  | 0.000217707 | This study | 88 |
| Formicidae\_A | Hymenoptera\_A | Arthropoda | Insecta |  | Hymenoptera |  |  | Y | 0.00071 | This study | 12 |
| Hymenoptera\_A | Hymenoptera\_A | Arthropoda | Insecta |  | Hymenoptera |  |  | Y | 0.00071 | This study | 987 |
| Isopoda\_A | Isopoda\_A | Arthropoda | Malacostraca |  | Isopoda |  |  |  | 0.00043 | This study | 48 |
| Lepidoptera\_A | Lepidoptera\_A | Arthropoda | Insecta |  | Lepidoptera |  |  |  | 0.02 | Kuhsel et al 2016 [20mg was the median DW for adult butterflies from https://www.researchgate.net/publication/303634267\_Surface\_area\_-\_volume\_ratios\_in\_insects/figures?lo=1] | 11 |
| Lepidoptera\_L | Lepidoptera\_L | Arthropoda | Insecta |  | Lepidoptera |  |  |  | 0.00615 | This study | 29 |
| Megaloptera\_L | Megaloptera\_L | Arthropoda | Insecta |  | Megaloptera |  |  |  | 0.0008 | Mothiversen, T., Thorup, J., 1987. Population dynamics and production of Sialis lutaria L. (Megaloptera) in the Danish River Suså. Freshwater Biology 17, 461-469. [Midpoint of Fig. 1] | 3 |
| Mysida\_A | Mysida\_A | Arthropoda | Malacostraca |  | Mysida |  |  |  | 0.0007 | This study | 2749 |
| Neuroptera\_A | Neuroptera\_other\_A | Arthropoda | Insecta |  | Neuroptera |  |  |  | 0.001252 | Romeis, J., Dutton, A., Bigler, F., 2004. Bacillus thuringiensis toxin (Cry1Ab) has no direct effect on larvae of the green lacewing Chrysoperla carnea (Stephens) (Neuroptera: Chrysopidae). Journal of Insect Physiology 50 2-3, 175-183. [Table 1 DW for Neuroptera fed Bt-sucrose] | 11 |
| Neuroptera\_L | Neuroptera\_other\_L | Arthropoda | Insecta |  | Neuroptera |  |  |  | 0.001252 | Used DW for Neuroptera\_A based on similar size/morphology | 2 |
| Sisyridae\_L | Sisyridae\_L | Arthropoda | Insecta |  | Neuroptera |  | Sisyridae |  | 0.001252 | Used DW for Neuroptera\_A based on similar size/morphology | 1 |
| Odonata\_A | Odonata\_A\_N | Arthropoda | Insecta |  | Odonata |  |  |  | 0.00488 | This study | 3 |
| Odonata\_N | Odonata\_A\_N | Arthropoda | Insecta |  | Odonata |  |  |  | 0.00488 | This study | 188 |
| Plecoptera\_A | Plecoptera\_A\_N | Arthropoda | Insecta |  | Plecoptera |  |  |  | 0.0006 | This study | 13 |
| Plecoptera\_N | Plecoptera\_A\_N | Arthropoda | Insecta |  | Plecoptera |  |  |  | 0.0006 | This study | 90 |
| Psocoptera\_A | Psocoptera\_A\_N | Arthropoda | Insecta |  | Psocoptera |  |  | Y | 0.0003 | This study | 300 |
| Psocoptera\_N | Psocoptera\_A\_N | Arthropoda | Insecta |  | Psocoptera |  |  | Y | 0.0003 | This study | 1 |
| Tanaidacea\_A | Tanaidacea\_A | Arthropoda | Malacostraca |  | Tanaidacea |  |  |  | 0.00051 | This study | 1426 |
| Thysanoptera\_A | Thysanoptera\_A | Arthropoda | Insecta |  | Thysanoptera |  |  | Y | 0.00045 | This study | 316 |
| Trichoptera\_A | Trichoptera\_A | Arthropoda | Insecta |  | Trichoptera |  |  |  | 0.00127 | This study | 203 |
| Hydropsychidae\_L | Trichoptera\_L | Arthropoda | Insecta |  | Trichoptera |  |  |  | 0.00069 | This study | 54 |
| Leptoceridae\_L | Trichoptera\_L | Arthropoda | Insecta |  | Trichoptera |  |  |  | 0.00069 | This study | 3 |
| Trichoptera\_L | Trichoptera\_L | Arthropoda | Insecta |  | Trichoptera |  |  |  | 0.00069 | This study | 1932 |
| Trichoptera\_P | Trichoptera\_L | Arthropoda | Insecta |  | Trichoptera |  |  |  | 0.00069 | This study | 9 |
| Actinopterygii\_L | Actinopterygii\_L | Chordata | Actinopterygii |  |  |  |  |  | 0.001 | https://www.st.nmfs.noaa.gov/spo/FishBull/932/pepin.pdf [based on the ~10mm larval fish in Fig 1] | 146 |
| Acari\_A | Hydracarina\_A\_N | Arthropoda | Arachnida | Acari |  |  |  |  | 0.00001 | Cramer Fish Sciences § | 2 |
| Hydracarina\_A | Hydracarina\_A\_N | Arthropoda | Arachnida | Acari |  |  |  |  | 0.00001 | Cramer Fish Sciences § | 368 |
| Hydracarina\_N | Hydracarina\_A\_N | Arthropoda | Arachnida | Acari |  |  |  |  | 0.00001 | Cramer Fish Sciences § | 4 |
| Bivalvia\_A | Bivalvia\_A | Mollusca | Bivalvia |  |  |  |  |  | 0.00001 | http://www.fao.org/3/y5720e/y5720e0b.htm ["Dry tissue weight was measured to 0.01 mg" on page 5] | 11 |
| Gastropoda\_A | Gastropoda\_A | Mollusca | Gastropoda |  |  |  |  |  | 0.00007 | Cramer Fish Sciences | 2 |
| Copepoda\_A | Copepoda\_A | Arthropoda | Maxillopoda | Copepoda |  |  |  |  | 0.00047 | This study | 4255 |
| Maxillopoda\_A | Copepoda\_A | Arthropoda | Maxillopoda | Copepoda |  |  |  |  | 0.00047 | This study | 7 |
| Cyprididae\_A | Ostracoda\_A | Arthropoda | Ostracoda |  |  |  |  |  | 0.00049 | This study | 94 |
| Ostracoda\_A | Ostracoda\_A | Arthropoda | Ostracoda |  |  |  |  |  | 0.00049 | This study | 5056 |
| Insecta\_A | Insecta\_A |  |  |  |  |  |  |  |  | Excluded as too much DW variation in taxa to estimate DW | 6 |
| Orthoptera\_A | Orthoptera\_A | Arthropoda | Insecta |  | Orthoptera |  |  |  |  | Excluded as too much DW variation in taxa to estimate DW | 1 |

§ Note similar to 24.5ug mean mite weight from Douce 1976 ("163 weighings were made utilizing 1528 mites, representing 25 species of adults and 16 groups of immature stages of several species") but as Cramer estimate is local we used that. Nymphs and adults similar size.

Table S4. Mean Cladocera catch per unit effort (CPUE = number per cubic meter) and standard deviation (SD) by year (Jan-June emigration season) and month. Monthly averages at each site were averaged to produce these values.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Cladocera CPUE across all sites shown in Fig. 1 | | | | |
| Year | Jan-June mean | Jan-June SD | Month | Monthly mean | Monthly SD |
| 2014 | 1146.9 | 4799.0 | 1 | 453.0 | 1858.7 |
|  |  |  | 2 | 1047.8 | 3598.8 |
|  |  |  | 3 | 174.3 | 425.6 |
|  |  |  | 4 | 2045.8 | 8601.9 |
|  |  |  | 5 | 467.3 | 1177.9 |
|  |  |  | 6 | 2693.0 | 6872.5 |
| 2015 | 900.1 | 4648.8 | 1 | 38.0 | 57.2 |
|  |  |  | 2 | 150.8 | 233.0 |
|  |  |  | 3 | 53.5 | 117.5 |
|  |  |  | 4 | 423.3 | 975.8 |
|  |  |  | 5 | 1570.0 | 4872.5 |
|  |  |  | 6 | 3165.1 | 10131.3 |
| 2016 | 1903.9 | 5831.6 | 1 | 567.8 | 1340.5 |
|  |  |  | 2 | 363.4 | 430.7 |
|  |  |  | 3 | 669.5 | 2069.4 |
|  |  |  | 4 | 2386.1 | 6648.6 |
|  |  |  | 5 | 2161.9 | 3223.0 |
|  |  |  | 6 | 5235.7 | 11633.4 |
| 2017 | 2297.1 | 10596.6 | 1 | 565.6 | 864.9 |
|  |  |  | 2 | 444.8 | 254.4 |
|  |  |  | 3 | 376.8 | 311.9 |
|  |  |  | 4 | 577.6 | 631.5 |
|  |  |  | 5 | 5819.3 | 13751.7 |
|  |  |  | 6 | 5830.9 | 21947.5 |
| 2018 | 1385.7 | 7581.7 | 1 | 365.2 | 1254.1 |
|  |  |  | 2 | 356.9 | 810.5 |
|  |  |  | 3 | 820.5 | 2479.0 |
|  |  |  | 4 | 1653.9 | 5583.0 |
|  |  |  | 5 | 532.8 | 1032.9 |
|  |  |  | 6 | 4596.9 | 17704.1 |

**A B**

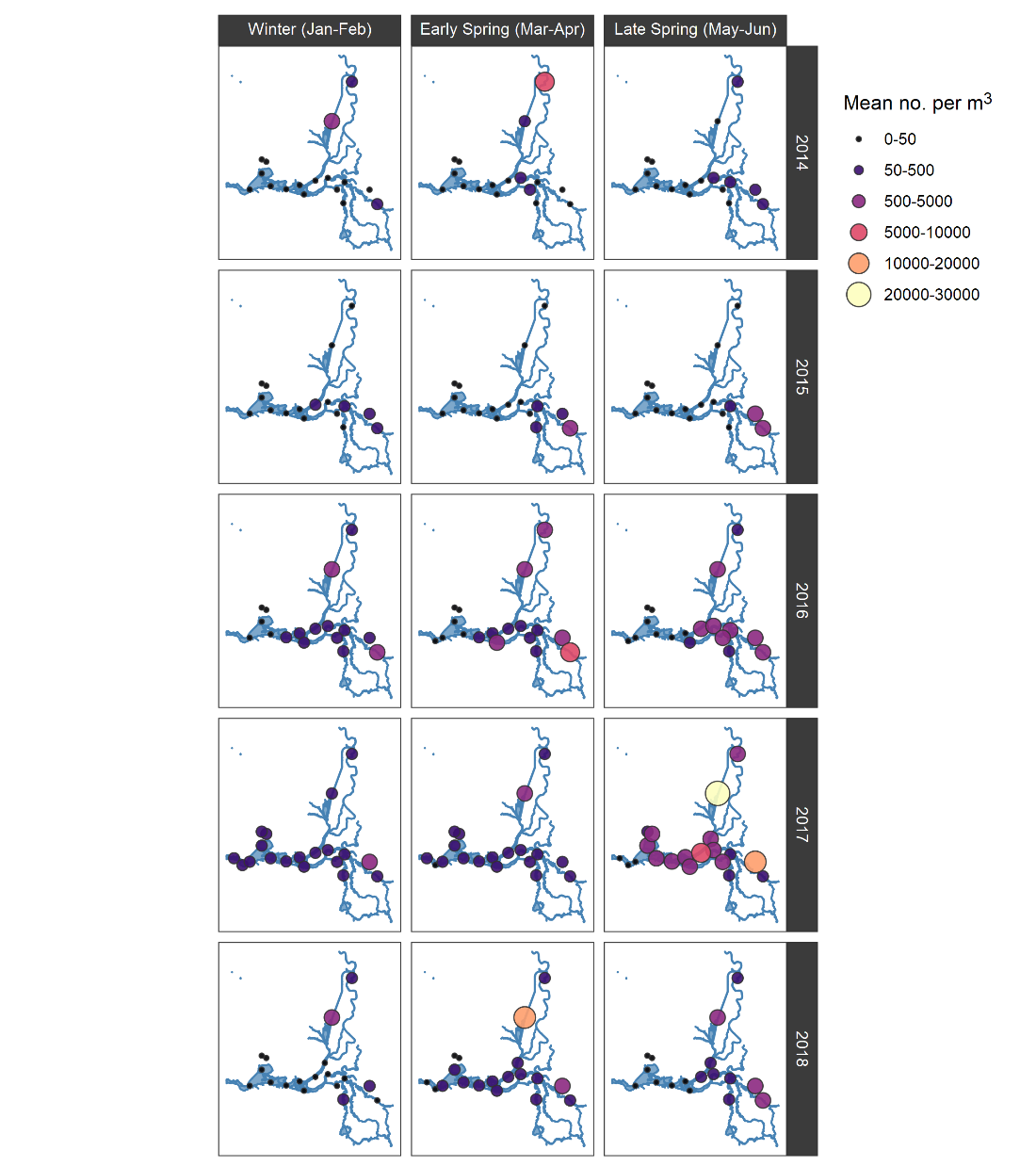
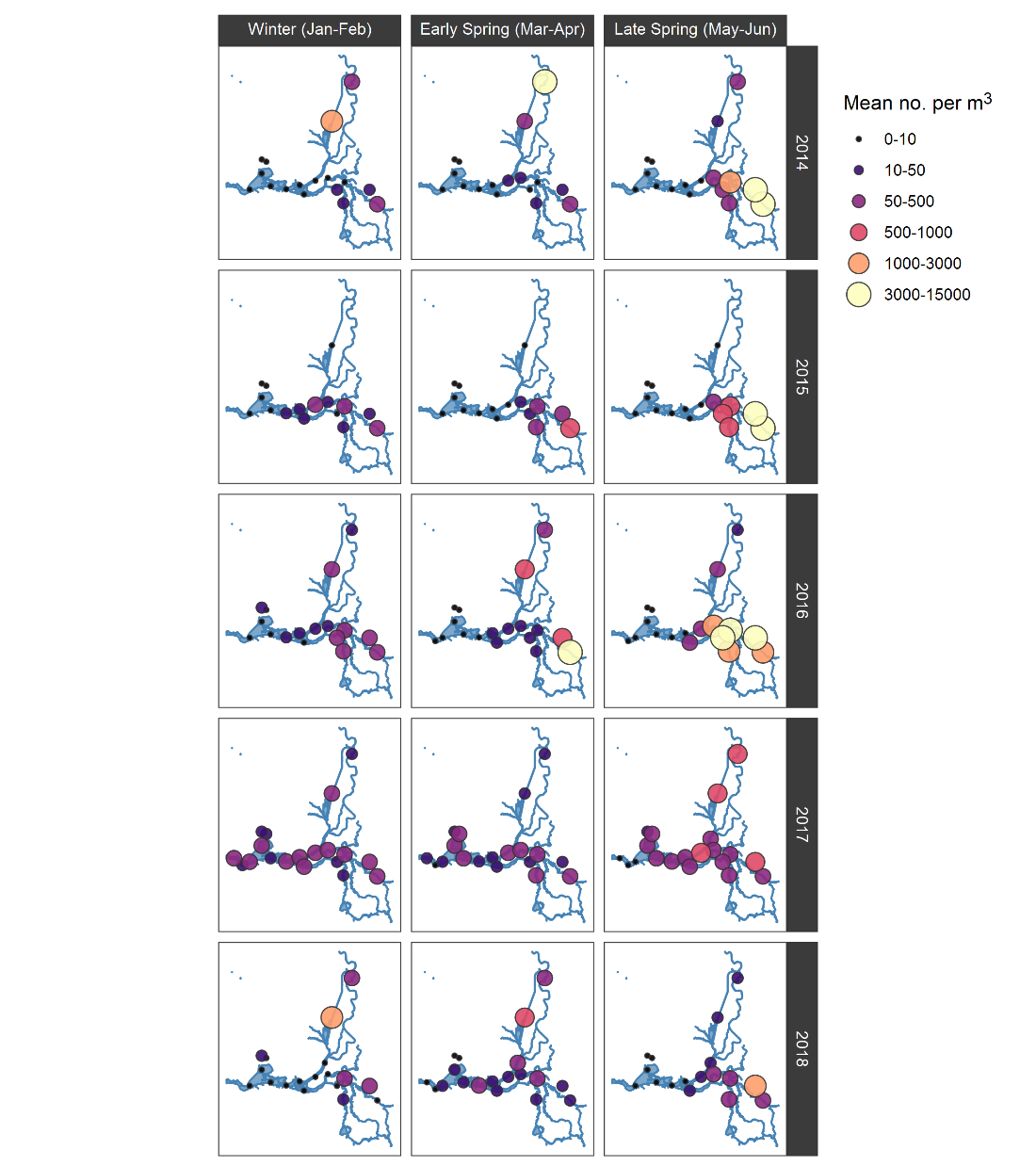
 

Fig. S1 Mean bimonthly densities of (A) *Bosmina* spp.and (B) *Daphnia* spp.in Jan-June 2014-2018 in the Sacramento-San Joaquin River Delta. Size and color of symbol indicates estimated abundance per meter squared (see key).

Calendar

Description automatically generated

Fig. S2 (A) The fraction of total monthly Delta outflow represented by the Cosumnes River (circles) and Yolo Bypass (triangles) across the study period, estimated from CA DWR’s Dayflow metric. (B) The ratio of Cosumnes River monthly total flow to Yolo Bypass monthly total flow across the study period, where points above the red line indicate months when Cosumnes flows exceeded Yolo Bypass flows.