

# A paradox of restoration: prey habitat engineering for an introduced, threatened carnivore can support native biodiversity

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TABLE S1 Percentage of (re)constructed ponds and other water bodies (see text for further details; Fig. 1) occupied by family, genus or species of macroinvertebrates (with mean number of individuals per sample in parentheses) and the habitat type where the taxa were significantly more common ( $P < 0.05$ ) according to indicator values, calculated at family level (for Staphyliniformia at infraorder and for Trombidiformes at order level). The families found only in (re)constructed ponds are indicated in bold.

| Order (by Class)  | Family/genus/species            | (Re)constructed ponds (n=16) | Other water bodies (n=13) | Preference         | Indicator value |
|-------------------|---------------------------------|------------------------------|---------------------------|--------------------|-----------------|
| <b>Clitellata</b> |                                 |                              |                           |                    |                 |
| Hirudinida        | <b>Erpobdellidae</b>            | 13(0.6)                      |                           |                    |                 |
|                   | <i>Erpobdella octoculata</i>    | 6(0.6)                       |                           |                    |                 |
|                   | <i>Erpobdella testacea</i>      | 6(0.1)                       |                           |                    |                 |
|                   | Glossiphoniidae                 | 13(0.1)                      | 8(0.2)                    |                    |                 |
|                   | <i>Glossiphonia complanata</i>  |                              | 8(0.1)                    |                    |                 |
|                   | <i>Glossiphonia concolor</i>    |                              | 8(0.1)                    |                    |                 |
|                   | <i>Helobdella stagnalis</i>     | 13(0.1)                      |                           |                    |                 |
|                   | Haemopidae                      | 6(0.1)                       | 8(0.1)                    |                    |                 |
|                   | <i>Haemopsis sanguisuga</i>     | 6(0.1)                       | 8(0.1)                    |                    |                 |
| Lumbriculida      | Lumbriculidae                   | 19(2)                        | 92(14.5)                  | Other water bodies | 81              |
|                   | <i>Lumbriculus variegatus</i>   | 19(2)                        | 92(14.2)                  |                    |                 |
|                   | <i>Tatriella slovenica</i>      |                              | 8(0.3)                    |                    |                 |
| Tubificida        | Tubificidae                     | 19(0.3)                      | 62(9.2)                   | Other water bodies | 60              |
|                   | <i>Cognettia glandulosa</i>     |                              | 38(1.5)                   |                    |                 |
|                   | <i>Limnodrilus hoffmeisteri</i> | 6(0.1)                       | 8(0.2)                    |                    |                 |
|                   | <i>Tubifex tubifex</i>          | 13(0.2)                      | 46(7.5)                   |                    |                 |
|                   |                                 |                              |                           |                    |                 |
| <b>Gastropoda</b> |                                 |                              |                           |                    |                 |
|                   | Bradybaenidae                   |                              | 8(0.1)                    |                    |                 |
|                   | <i>Bradybaena fruticum</i>      |                              | 8(0.1)                    |                    |                 |
|                   | <b>Cochlicopidae</b>            | 6(0.1)                       |                           |                    |                 |
|                   | <i>Cochlicopa nitens</i>        | 6(0.1)                       |                           |                    |                 |
|                   | Euconulidae                     |                              | 15(0.2)                   |                    |                 |
|                   | <i>Euconulus alderi</i>         |                              | 15(0.2)                   |                    |                 |
|                   | Gastrodontidae                  | 19(0.2)                      | 15(0.2)                   |                    |                 |
|                   | <i>Zonitoides nitidus</i>       | 19(0.2)                      | 15(0.2)                   |                    |                 |
|                   | Hygromiidae                     |                              | 8(0.2)                    |                    |                 |
|                   | <i>Trichia hispida</i>          |                              | 8(0.2)                    |                    |                 |
|                   | Lymnaeidae                      | 25(5)                        | 15(0.5)                   |                    |                 |
|                   | <i>Galba truncatula</i>         | 6(0.3)                       |                           |                    |                 |
|                   | <i>Radix balthica</i>           | 13(4.5)                      |                           |                    |                 |
|                   | <i>Stagnicola palustris</i>     | 6(0.2)                       | 8(0.5)                    |                    |                 |
|                   | Oxychilidae                     |                              | 8(0.1)                    |                    |                 |
|                   | <i>Nesovitrea petronella</i>    |                              | 8(0.1)                    |                    |                 |

| Order (by Class)    | Family/genus/species           | (Re)constructed ponds (n=16) | Other water bodies (n=13) | Preference            | Indicator value |
|---------------------|--------------------------------|------------------------------|---------------------------|-----------------------|-----------------|
|                     | Physidae                       | 13(0.1)                      | 46(0.8)                   | Other water bodies    | 40              |
|                     | <i>Aplexa hypnorum</i>         | 13(0.1)                      | 46(0.8)                   |                       |                 |
|                     | Planorbidae                    | 56(133.3)                    | 8(0.1)                    | (Re)constructed ponds | 56              |
|                     | <i>Anisus spirorbis</i>        |                              | 8(0.1)                    |                       |                 |
|                     | <i>Bathyomphalus contortus</i> | 25(1.6)                      |                           |                       |                 |
|                     | <i>Gyraulus crista</i>         | 19(37.4)                     |                           |                       |                 |
|                     | <i>Hippeutis complanatus</i>   | 6(82.3)                      |                           |                       |                 |
|                     | <i>Planorbis planorbis</i>     | 25(12)                       |                           |                       |                 |
| <b>Bivalvia</b>     | Succineidae                    | 31(1.1)                      | 15(0.2)                   |                       |                 |
|                     | Sphaeridae                     | 75(18.9)                     | 54(27)                    |                       |                 |
|                     | Sphaeridae sp.                 | 38(7.6)                      |                           |                       |                 |
|                     | <i>Musculium lacustre</i>      | 63(2.7)                      |                           |                       |                 |
| <b>Arachnida</b>    |                                |                              |                           |                       |                 |
| Araneae             | <b>Anyphaenidae</b>            | 6(0.1)                       |                           |                       |                 |
|                     | <b>Araneidae</b>               | 6(0.1)                       |                           |                       |                 |
|                     | <b>Cybaeidae</b>               | 19(0.5)                      |                           |                       |                 |
|                     | <i>Argyroneta aquatica</i>     | 19(0.5)                      |                           |                       |                 |
|                     | Linyphiidae                    | 6(0.1)                       | 8(0.1)                    |                       |                 |
|                     | <i>Gnathonarium dentatum</i>   | 6(0.1)                       |                           |                       |                 |
|                     | <i>Oedothorax gibbosus</i>     |                              | 8(0.1)                    |                       |                 |
|                     | Lycosidae                      | 19(0.3)                      | 8(0.1)                    |                       |                 |
|                     | Lycosidae sp.                  | 6(0.1)                       |                           |                       |                 |
|                     | <i>Pirata</i> sp.              | 13(0.2)                      |                           |                       |                 |
|                     | <b>Pisauridae</b>              | 6(0.1)                       |                           |                       |                 |
|                     | <i>Pisaura mirabilis</i>       | 6(0.1)                       |                           |                       |                 |
|                     | Tetragnathidae                 | 13(0.1)                      | 38(0.5)                   |                       |                 |
|                     | Tetragnathidae sp.             | 6(0.1)                       |                           |                       |                 |
|                     | <i>Pachygnatha clercki</i>     | 6(0.1)                       |                           |                       |                 |
|                     | <b>Thomisidae</b>              | 6(0.1)                       |                           |                       |                 |
|                     | <i>Tibellus</i> sp.            | 6(0.1)                       |                           |                       |                 |
| Trombidiformes      |                                | 63(3.7)                      | 15(0.2)                   | (Re)constructed ponds | 60              |
| <b>Malacostraca</b> |                                |                              |                           |                       |                 |
| Amphipoda           | Gammaridae                     | 6(0,6)                       | 8(0.1)                    |                       |                 |
|                     | <i>Gammarus</i> sp.            | 6(0.6)                       |                           |                       |                 |
| Isopoda             | Asellidae                      | 88(89.7)                     | 92(267.7)                 |                       |                 |
|                     | <i>Asellus aquaticus</i>       | 88(89.7)                     | 92(267.7)                 |                       |                 |
| <b>Insecta</b>      |                                |                              |                           |                       |                 |
| Coleoptera          | <b>Chrysomelidae</b>           | 6(0.1)                       |                           |                       |                 |
|                     | <b>Dryopidae</b>               | 6(0.1)                       |                           |                       |                 |
|                     | Dytiscidae                     | 81(6.1)                      | 69(3.3)                   |                       |                 |
|                     | <b>Haliplidae</b>              | 50(2.4)                      |                           | (Re)constructed ponds | 50              |
|                     | Staphyliniformia               | 56(3.1)                      | 46(2.7)                   |                       |                 |
|                     | <b>Noteridae</b>               | 6(0.1)                       |                           |                       |                 |

| Order (by Class)     | Family/genus/species         | (Re)constructed ponds (n=16) | Other water bodies (n=13) | Preference            | Indicator value |
|----------------------|------------------------------|------------------------------|---------------------------|-----------------------|-----------------|
|                      | Scirtidae                    | 6(0.9)                       | 77(15.3)                  | Other water bodies    | 73              |
| Diptera              | Ceratopogonidae              | 25(0.4)                      | 15(0.5)                   |                       |                 |
|                      | Chaoboridae                  | 63(44.8)                     | 85(12.8)                  |                       |                 |
|                      | Chironomidae                 | 100(176.4)                   | 100(67.6)                 |                       |                 |
|                      | Culicidae                    | 44(6.3)                      | 100(221.7)                | Other water bodies    | 97              |
|                      | Dixidae                      | 6(0.1)                       | 62(3.7)                   | Other water bodies    | 61              |
| Ephemeroptera        | <b>Tabanidae</b>             | 13(0.1)                      |                           |                       |                 |
|                      | Baetidae                     | 100(56.6)                    | 23(1.9)                   | (Re)constructed ponds | 96,7            |
|                      | <b>Caenidae</b>              | 50(3.8)                      |                           | (Re)constructed ponds | 50              |
| Hemiptera            | Leptophlebiidae              | 6(1.8)                       | 8(0.8)                    |                       |                 |
|                      | Corixidae                    | 88(7.6)                      | 8(0.4)                    | (Re)constructed ponds | 83              |
|                      | Gerridae                     | 44(4.6)                      | 8(0.1)                    |                       |                 |
|                      | <b>Naucoridae</b>            | 19(0.6)                      |                           |                       |                 |
|                      | <b>Notonectidae</b>          | 56(5.1)                      |                           | (Re)constructed ponds | 56              |
| Lepidoptera          | <b>Pleidae</b>               | 6(0.1)                       |                           |                       |                 |
|                      | Crambidae                    | 19(0.3)                      | 8(0.2)                    |                       |                 |
| Odonata              | <b>Aeshnidae</b>             | 75(4.9)                      |                           | (Re)constructed ponds | 75              |
|                      | Aeshnidae sp.                | 56(4.4)                      |                           |                       |                 |
|                      | <i>Aeshna</i> sp.            | 6(0.2)                       |                           |                       |                 |
|                      | <i>Aeshna cyanea</i>         | 6(0.1)                       |                           |                       |                 |
|                      | <i>Aeshna grandis</i>        | 6(0.2)                       |                           |                       |                 |
|                      | <i>Aeshna viridis</i>        | 6(0.1)                       |                           |                       |                 |
|                      | <b>Coenagrionidae</b>        | 75(12.6)                     |                           | (Re)constructed ponds | 75              |
|                      | Coenagrionidae sp.           | 69(9.9)                      |                           |                       |                 |
|                      | <i>Coenagrion</i> sp.        | 13(0.4)                      |                           |                       |                 |
|                      | <i>Coenagrion armatum</i>    | 13(0.1)                      |                           |                       |                 |
|                      | <i>Coenagrion hastulatum</i> | 13(1.3)                      |                           |                       |                 |
|                      | <i>Coenagrion</i> sp.        | 6(0.1)                       |                           |                       |                 |
|                      | <i>Coenagrion puella</i>     | 6(0.1)                       |                           |                       |                 |
|                      | <i>Enallagma cyathigerum</i> | 6(0.4)                       |                           |                       |                 |
|                      | <i>Erythromma najas</i>      | 6(0.1)                       |                           |                       |                 |
|                      | <i>Nehalennia speciosa</i>   | 6(0.2)                       |                           |                       |                 |
|                      | <b>Cordulidae</b>            | 31(0.8)                      |                           |                       |                 |
|                      | Cordulidae sp.               | 25(0.8)                      |                           |                       |                 |
|                      | <i>Cordulia aenea</i>        | 6(0.1)                       |                           |                       |                 |
|                      | <b>Lestidae</b>              | 69(11.4)                     |                           | (Re)constructed ponds | 69              |
| Lestidae sp.         | 63(9.6)                      |                              |                           |                       |                 |
| <i>Lestes dryas</i>  | 6(0.3)                       |                              |                           |                       |                 |
| <i>Lestes sponsa</i> | 13(1.1)                      |                              |                           |                       |                 |

| Order (by Class) | Family/genus/species          | (Re)constructed ponds (n=16) | Other water bodies (n=13) | Preference                                     | Indicator value |
|------------------|-------------------------------|------------------------------|---------------------------|--|-----------------|
|                  | <i>Lestes virens</i>          | 6(0.3)                       |                           |  |                 |
|                  | <b>Libellulidae</b>           | 56(3.6)                      |                           | (Re)constructed ponds                          | 56              |
|                  | Libellulidae sp.              | 56(3.6)                      |                           |  |                 |
|                  | <i>Leucorrhinia albifrons</i> | 6(0.1)                       |                           |  |                 |
| Plecoptera       | Nemouridae                    | 25(0.4)                      | 23(0.8)                   |  |                 |
| Trichoptera      | Limnephilidae                 | 38(4.8)                      | 46(2.2)                   |  |                 |
|                  | Phryganeidae                  | 13(0.3)                      | 46(1.5)                   | Other water bodies                             | 38              |
|                  | <b>Polycentropodidae</b>      | 13(0.1)                      |                           |  |                 |
| <i>Total</i>     |                               | 100(617)                     | 100(657)                  | 11 (re)constructed ponds, 7 other water bodies |                 |