

Supplementary Materials

Table S1. Characteristics of the studied sites with more of five points: Longitude, Latitude, Altitude, Precipitation and Time since last fire.

| 1-year | 58° 50' | 36° 43' | 2027 | 300 | 1 |
|----------------|---------|---------|------|-----|--------------------------|
| 4-year | 58° 55' | 36° 37' | 1850 | 271 | 4 |
| 10-year | 58° 43' | 36° 33' | 2062 | 302 | 10 |
| 20-year | 58° 30' | 36° 40' | 2220 | 310 | 20 |
| Control | 58° 28' | 36° 47' | 2723 | 327 | Without fire disturbance |

Table S2. A list of plant species presents in study sites and their functional trait values. Mean trait values were obtained in species level except for plant species marked by * (for these plant species, mean trait values were obtained in genus level).

| Plant Species Name | Growth form | Plant Height (m) | C (mg.g-1) | N (mg.g-1) | Seed Mass (mg) | Life Span | SLA (m ² .kg-1) |
|---|-------------|------------------|-------------|-------------|----------------|-----------|-----------------------------|
| <i>Scandix stellata</i> Banks & Sol. | Herb | 0.49 | 449.3 | 24.79 | 13.38 | Annual | 12.19 |
| <i>Polygonum aviculare</i> L. | Herb | 0.43 | 439.61 | 31.91 | 2.83 | Annual | 33.05 |
| <i>Androsace maxima</i> L. | Herb | 0.014 | 436.07 | 21.12 | 1.15 | Annual | 24.21 |
| <i>Veronica hederifolia</i> L. | Herb | 0.29 | 454.22 | 22.67 | 3.98 | Annual | 34.98 |
| <i>Papaver dubium</i> L. | Herb | 0.36 | 458.96 | 41.84 | 0.17 | Annual | 30.04 |
| <i>Bromus tectorum</i> L. | Grass | 0.26 | 422.06 | 31.32 | 2.48 | Annual | 29.56 |
| <i>Ceratocephala falcate</i> (L.) Pers. | Herb | 0.53 | 442 | 26.05 | 5.31 | Annual | 51.09 |
| <i>Alyssum linifolium</i> * Stephan ex Willd. | Herb | 0.23 | 421.17 | 29.4 | 1.21 | Annual | 28.98 |
| <i>Filago arvensis</i> L. | Herb | | 435 | 30 | 0.26 | Annual | NA |
| <i>Ziziphora tenuior</i> L. | Herb | 0.18 | 451.86 | NA | 0.4 | Annual | 28.7 |
| <i>Arctium lappa</i> L. | Herb | 0.85 | 435.92 | 23.05 | 25.4 | Annual | NA |
| <i>Cichorium intybus</i> L. | Herb | NA | 435.92 | 35.5 | NA | Annual | NA |
| <i>Carex stenophylla</i> | Grass | 0.31 | 438.21 | 21.09 | NA | Annual | 19.95 |
| <i>Erodium cicutarium</i> Wahlenb. | Herb | 0.43 | 451.51 | 19.7 | 2.3 | Annual | 28.32 |
| <i>Stipa arabica</i> Trin. & Rupr. | Grass | 0.56 | 450.49 | 18.16 | 3.43 | Annual | 41.35 |
| <i>Stellaria media</i> (L.) Vill. | Herb | NA | 467.08 | 40.43 | 0.4 | Annual | NA |
| <i>Vicia ervilia</i> (L.) Willd. | Herb | 0.4 | 472.97 | 33.77 | 40.5 | Annual | 19.61 |
| <i>Hypericum scabrum</i> L. | Herb | 0.37 | 445.6 | 22.1 | 0.158 | Annual | 26.05 |
| <i>Thlaspi perfoliatum</i> L. | Herb | 0.22 | 422.38 | 38.84 | 1.24 | Annual | 29.61 |
| <i>Taeniathrum caput-madusae</i> L. | Grass | 0.15 | 430.61 | 45.77 | 5.19 | Annual | NA |
| <i>Serratula latifolia</i> Bioss. | Herb | 0.12 | 435.25 | 25.6 | 2.21 | Annual | 17.08 |
| <i>Silene swertiaefolia</i> Bioss. | Herb | 0.34 | 467.08 | 36.6 | 0.616 | Annual | 26.35 |
| <i>Holosteum glutinosum</i> (M.Bieb.) | Herb | 0.13 | 467.09 | 23.59 | 0.096 | Annual | 37.03 |
| <i>Achillea santolinoides</i> subsp. <i>wilhelmsii</i> (K.Koch) Greuter | Herb | 0.29 | 410.61 | 25.83 | 0.43 | Annual | 15.55 |

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|---|---------|------|--------|-------|--------|-----------|--------|
| <i>Hymenocrater calycinus</i> * (Boiss.) Benth. | Herb | 0.5 | 451.86 | 23.37 | 25.4 | Perennial | 28.7 |
| <i>Perovskia abrotanoides</i> Kar. | Herb | 0.35 | 439.63 | 21.71 | 2.67 | Perennial | 23.27 |
| <i>Thalictrum sultanabadense</i> Stapf | Herb | 0.24 | 448 | 30.84 | 1.8 | Perennial | 27.04 |
| <i>Eremurus spectabilis</i> M. Bieb. | Herb | 0.53 | NA | 23.66 | 6.68 | Perennial | 10.49 |
| <i>Noaea mucronata</i> (Forssk.) | Herb | 0.6 | 385.31 | 25.02 | 4.2 | Perennial | 21.32 |
| <i>Verbascum cheiranthifolium</i> Boiss. | Herb | 0.84 | 489.01 | 20.8 | 0.11 | Perennial | 16.81 |
| <i>Onosma longilobum</i> Bunge | Herb | 0.32 | 416.86 | 34.72 | NA | Perennial | 26.3 |
| <i>Callipeltis cucullaris</i> (L.) DC. | Herb | NA | NA | NA | 59.18 | Annual | NA |
| <i>Asperula glomerata</i> (M. Bieb.) | Herb | 0.28 | 477 | 27.17 | 2.38 | Annual | 24.011 |
| <i>Valerianella tuberculata</i> Boiss. | Herb | 0.42 | 451.97 | 0.18 | 3.06 | Annual | 38.075 |
| <i>Galium aparine</i> L. | Herb | 0.39 | 434.04 | 0.72 | 9.92 | Annual | 34.67 |
| <i>Bromus danthoniae</i> Trin. | Grass | 0.37 | 426.05 | 0.37 | 4.5 | Annual | 25.92 |
| <i>Ixiolirion tataricum</i> (Pall.) | Herb | 0.15 | NA | NA | NA | Annual | NA |
| <i>Bunium persicum</i> (Boiss.) | Herb | 0.5 | 448 | 0.42 | 1.4 | Perennial | 18.03 |
| <i>Phlomis cancellata</i> Bunge | Herb | 0.97 | 451.86 | 0.75 | 5.9 | Perennial | 10.095 |
| <i>Alcea angulate</i> Freyn & Sint. | Herb | 1.55 | 442.8 | 0.12 | 9.98 | Perennial | 14.29 |
| <i>Eryngium bungei</i> Boiss. | Herb | 0.25 | 448.08 | 0.25 | 4.62 | Perennial | 8.89 |
| <i>Artemisia kopetdaghensis</i> * Krasch., Popov. | shrub | 0.88 | 456.44 | 0.88 | 9.96 | Perennial | 25.57 |
| <i>Cotoneaster nummularius</i> * Lindl. | shrub | 2.22 | 454.9 | 20.1 | 5.28 | Perennial | 11.89 |
| <i>Prunus microcarpa</i> C.M. Mey. | shrub | 0.27 | 431.56 | 33.83 | NA | Perennial | 28.17 |
| <i>Acantholimon pterostegium</i> Bunge | cushion | 0.2 | NA | 25.11 | 29.88 | Perennial | 14.02 |
| <i>Lactuca orientalis</i> (Boiss.) Boiss. | shrub | 0.5 | 435.92 | 24.4 | 0.64 | Perennial | 30.61 |
| <i>Poa bulbosa</i> L. | Grass | 0.23 | 438.21 | 13.42 | 0.45 | Perennial | 18.06 |
| <i>Elymus hispidus</i> (Opiz) Melderis | Grass | 0.51 | 439.07 | 18.41 | 327.37 | Perennial | 10.36 |
| <i>Lonicera nummulariifolia</i> * Jaub. & Spach | shrub | 2.44 | 476.61 | 20.38 | 12.33 | Perennial | 23.81 |
| <i>Ziziphora clinopodioides</i> Lam. | shrub | 0.88 | 451.81 | 23.37 | 0.32 | Perennial | 28.7 |

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|---|---------|------|--------|-------|-------|-----------|-------|
| <i>Juniperus polycarpus</i> K. Koch | shrub | 0.45 | 515.74 | 16.04 | 38.9 | Perennial | 4.2 |
| <i>Astragalus verus</i> Olivier | shrub | 0.38 | 431.56 | 33.83 | 5.28 | Perennial | 28.17 |
| <i>Rosa beggeriana</i> Schrenk ex Fisch. & C.A.Mey. | shrub | 2.1 | 454.9 | 18.67 | 14.23 | Perennial | 13.07 |
| <i>Acanthophyllum glandulosum</i> Bunge ex Boiss. | cushion | 0.55 | 467.08 | 23.59 | 0.81 | Perennial | 29.53 |
| <i>Tragopogon gaudanicus</i> Boriss. | Herb | 0.24 | 420.55 | 21.08 | 12.45 | Annual | 25.35 |