**Table S1:** Plant community composition and dominant species at different grazing stages.

|  |  |  |
| --- | --- | --- |
| **Grazing Stage** | **Community** | **Dominant Species** |
| Light grazing | *Leymus chinensis* | *Leymus chinensis, Poa sphondylodes* |
| Moderate grazing | *Leymus chinensis*-bunch grass | *Poa sphondylodes, Leymus chinensis, Cleistogenes squarrosa, Stipa baicalensis, Koeleria macrantha, Carex duriuscula* |
| Heavy grazing | *Leymus chinensis-Stipa baicalensis-Cleistogenes squarrosa -Carex duriuscula* | *Leymus chinensis, Stipa baicalensis, Cleistogenes squarrosa , Carex duriuscula,* *Aster pekinensis,* *Potentilla chinensis* |
| Overgrazing | *Cleistogenes squarrosa* -*Stipa baicalensis*-*Carex duriuscula* | *Cleistogenes squarrosa, Stipa baicalensis, Leymus chinensis, Carex duriuscula, Chloris virgate, Artemisia scoparia* |
| Extremely overgrazing | *Carex duriuscula*-*Cleistogenes squarrosa*-*Stipa baicalensis* | *Carex duriuscula, Cleistogenes squarrosa*, *Stipa baicalensis,*  *Astragalus galactites,* *Suaeda glauca* |

**Table S2:** Species abundance distribution models at different grazing stages.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Grazing Stage** | **Null** | | **NPM** | | **LNM** | | **ZM** | | **ZMM** | |
| **AIC** | **D** | **AIC** | **D** | **AIC** | **D** | **AIC** | **D** | **AIC** | **D** |
| LG | 616.72 | 515.46 | 195.46 | 92.20 | 145.33 | 40.07 | 187.21 | 81.95 | 124.95 | 17.68 |
| MG | 487.14 | 445.49 | 66.69 | 23.04 | 89.67 | 44.01 | 136.92 | 91.27 | 69.06 | 21.40 |
| HG | 39.51 | 4.89 | 38.61 | 1.99 | 40.99 | 2.37 | 43.66 | 5.04 | 42.01 | 1.39 |
| OG | 255.45 | 189.73 | 111.53 | 43.81 | 77.85 | 8.13 | 96.81 | 27.08 | 81.54 | 9.82 |
| EG | 126.86 | 12.43 | 124.48 | 8.06 | 133.71 | 15.29 | 173.42 | 55.00 | 128.30 | 7.88 |

LG—light grazing, MG—moderate grazing, HG—heavy grazing, OG—overgrazing, EG—extremely overgrazing. NULL—NULL model, NPM—Niche Preemption model, LNM—Lognormal model, ZM—Zipf model, ZMM—Zipf Mandelbrot model. AIC—Akaike information criterion.