**Appendix Table 1** Landscape metrics used in this study and their equations and ecological descriptions

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| Index | Equation | Description |
| TA | (ha) | Total area. ai, area of the ith patch (m2). |
| NP |  | Number of patches. ni, number of patches of the focal type in landscape. |
| LPI | （%） | Largest patch index, percentage of the largest patch of the focal type in the landscape, mainly reflecting configuration. AT, total landscape area (m2). |
| AREA\_MN | (ha) | Mean patch area, mainly reflecting configuration. |
| PARA\_AM |  | Area-weighted Perimeter-Area Ratio, mainly reflecting the complexity of patch shape, ratio of the patch perimeter (m) to area (m2). pij, perimeter (m) of patch i. |
| LSI |  | Landscape shape index, mainly reflecting the aggregation/dispersion of patches, eik, total length (m) of edge in landscape between patch types i and k. |
| ENN\_MN | (m) | Euclidean Nearest-Neighbor Distance, mainly reflecting the connectivity of patches, hij, distance (m) from patch ij to nearest neighboring patch of the same type |