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|---|---|
| Title | Ecological carrying capacity of terrestrial habitat |
| Abstract | This Indicator accounts for how the generalised quality of terrestrial habitats supporting biodiversity at each location and its connection with habitat at other locations within a neighbourhood enables biological movement such as foraging, dispersal and migration. It is used to account for the carrying capacity of a landscape to support its original complement of biodiversity and ecosystems. This indicator (3.1c) is part of a family of measures on the condition and connectivity of habitat, including its capacity to support the needs of native plants, animals and ecosystems in NSW, as a proportion relative to that in the pre-industrial era. Ecological condition and ecological carrying capacity are used to estimate the 'state of biodiversity including undiscovered species' and ecological condition is used to estimate 'expected survival of all known and undiscovered species' is one of a series of indicators on the status of biodiversity and ecological integrity in NSW developed to contribute to assessing the performance of the Biodiversity Conservation Act 2016. The overarching indicator framework which outlines how indicators are related and derived is presented in the "method to assess biodiversity and ecological integrity across New South Wales" (OEH, 2018). |

## Resource locator

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| Data Quality Statement | Name: Data Quality Statement<br>Protocol: WWW:DOWNLOAD-1.0-http--download<br>Description:<br>Data quality statement for Ecological carrying capacity of terrestrial native vegetation indicator<br>Function: download |
| Download Package | Name: Download Package<br>Protocol: WWW:DOWNLOAD-1.0-http--download<br>Description:<br>Raster Data (TIFF)<br>Function: download |

## Unique resource identifier

| | |
|---|---|
| Code | 3e90e34d-7423-4932-bb7c-625ff1ec9074 |
| Presentation form | Document digital |
| Edition | 1 |
| Dataset language | English |

## Metadata standard

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|---|---|
| Name | ISO 19115 |
| Edition | 2016 |
| Dataset URI | https://datasets.seed.nsw.gov.au/dataset/3e90e34d-7423-4932-bb7c-625ff1ec9074 |
| Purpose | Legislative and regulatory requirements |
| Status | Completed |
| Spatial representation | grid |

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|---|---|
| type | |
| **Spatial reference system** | |
| Code identifying the spatial reference system | 4283 |
| Spatial resolution | 90 m |
| Additional information source | Love, J., Drielsma, M. J., Williams, K., Thapa, R., (2018) Data package for habitat condition indicators; 3.1a ecological condition, 3.1b ecological connectivity and 3.1c ecological carrying capacity. Biodiversity Indicator Program, NSW Office of Environment and Heritage, Sydney. OEH (2018). A Method to Assess Biodiversity and Ecological Integrity across New South Wales. NSW Office of Environment and Heritage, Sydney. Love, J., Drielsma, M. J., Williams, K., Thapa, R., (2018) A new integrated model-data fusion approach to measuring ecosystem quality for ecological integrity reporting. Biodiversity Indicator Program Implementation Report Series, NSW Office of Environment and Heritage, Sydney. |
| **Topic category** | |

## Keyword set

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|---|---|
| keyword value | ECOLOGY-Landscape<br>VEGETATION<br>FLORA-Native |
| Originating controlled vocabulary | |
| Title | ANZLIC Search Words |
| Reference date | 2008-05-16 |

## Geographic location

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|---|---|
| West bounding longitude | 140.800781 |
| East bounding longitude | 153.720703 |
| North bounding latitude | -37.160317 |
| South bounding latitude | -28.188244 |
| NSW Place Name | NSW |

## Vertical extent information

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|---|---|
| Minimum value | -100 |
| Maximum value | 2228 |
| Coordinate reference system | |
| Authority code | urn:ogc:def:cs:EPSG:: |
| Code identifying the coordinate reference system | 5711 |

## Temporal extent

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|---|---|
| Begin position | 1995-01-01 |
| End position | N/A |

## Dataset reference date

## Resource maintenance

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|---|---|
| Maintenance and update frequency | As needed |
| Contact info | |
| Contact position | Data Broker |
| Organisation name | Department of Planning and Environment |
| Full postal address | data.broker@environment.nsw.gov.au |
| Telephone number | 131555 |
| Email address | data.broker@environment.nsw.gov.au |
| Responsible party role | pointOfContact |

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|---|---|
| Lineage | Ecological carrying capacity (Biodiversity Indicator Program, Indicator 3.1c) is a measure of colonisation potential (Hanski 1999) that uses spatial context analysis to build on ecological condition by integrating condition at each location with its connectivity to habitat in a surrounding neighbourhood. Spatial context analysis is performed using a similar least cost paths algorithm to that described above for ecological connectivity, with differences in how the accumulated values are assigned to the output grid. Where ecological connectivity values are determined at each grid cell from the accumulation of permeabilities of each traversing path, context analysis accumulates path values at their source by treating each cell as a focal cell from which paths originate. In this way, a measure of how well connected each cell is to its surrounding habitat is derived without requiring the paths between locations to be specifically mapped. Conceptually, the underlying algorithm for 3.1b and 3.1c are identical apart from parameterisation, and through planned refinements will be fully integrated into a single process.<br><br>Spatial context measures Neighbourhood Habitat Area (NHA) using the concept of colonisation potential (Hanski 1999, Drielsma & Ferrier 2009) and uses the Cost Benefit Approach (CBA) (Drielsma et al., 2007b) to model the amount of habitat accessible from, or connected to, each location. CBA, like the Spatial Links approach, is an adaptation of Dijkstra’s Least Cost Path (LCP) graph search algorithm (Dijkstra 1959; Cormen et al., 2001) used to solve Single-Source Shortest Path (SSSP) trees over rasterised spatial data. CBA is used to simulate generalised ecological processes including foraging, dispersal (of both flora and fauna) and migration across continuous valued rasterised representations of complex landscapes. Various sampling strategies are used to emulate entity properties such as habitat preferences, resource requirements, movement abilities and home range to propagule dispersal operating scales. To reflect the continuous and evolving nature of ecological processes, and account for indirect influences of change in other parts of the landscape, CBA is performed repeatedly with the habitat input of successive iterations moderated by the previous measure of NHA.<br><br>To derive ecological carrying capacity, CBA is applied using generalised parameters and spatial inputs scaled to multiple spatial resolutions that, like ecological connectivity, account for processes operating across a range of ecological scales. As with ecological connectivity, spatial inputs for ecological carrying capacity are sampled using multiple pixel offsets at each scale to account for the loss of detail that occurs when aggregating raster grids up to coarser resolutions. CBA is applied independently for each spatial resolution and at each sampled offset over several iterations where the habitat input of each is tempered by the output of the last. Once derived, the final NHA grids are resampled back to the<br><br>original finest resolution before being additively combined. The results of each resolution are equally weighted to moderate the contribution of each scale then added together with an equally weighted contribution from ecological condition resulting in a single spatial product measuring ecological carrying capacity representative of multiple ecological scales, at each 90 by 90 metre grid cell across the State. For more information and identification of the data used in the indicator refer to the work flow and implementation report in the data package. |
| Limitations on public access | |

## Responsible party


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| Contact position | Data Broker |
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## Metadata date

2022-06-02T00:14:18.235284

## Metadata language