Threatened Species Models in the Hunter, Central and Lower North Coast region of NSW

PRODUCED BY: The National Environmental Research Program (NERP) Environmental Decisions Hub at the University of Melbourne, for the Hunter & Central Coast Regional Environmental Management Strategy (HCCREMS)

DATE: 2015

PURPOSE: This data illustrates the modelled likelihood of occurrence of flora and fauna species with various levels of legal protection across the Hunter, Central & Lower North Coast region of NSW.

1. Abstract

The National Environmental Research Program (NERP) Environmental Decisions Hub at the University of Melbourne produced predictor layers for 151 threatened species. Species observations data was analysed against environmental variables to determine the likelihood of occurrence across the region. Threatened species listed under both federal and state legislation have been included (Table 1).

2. Data Processing

'Point occurrence data for all species within the region were downloaded from the Atlas of Living Australia and BioNet databases. Additional point data were provided by the NSW Office of Environment and Heritage and others.

'To reduce biases due to potentially outdated and/or inaccurate spatial data, point occurrence records were filtered. To reduce uncertainties associated with spatial accuracy and subsequent changes in environmental data, particularly vegetation cover, species records were excluded if they were observed prior to 1 January 1990. Records were also excluded if they had a spatial accuracy of greater than 100 m. The remaining data points for each species were then compared to a raster grid of the region with a 100 m grid resolution and all duplicate records within a given grid cell removed. Thus, the final data for each species represents the distribution of occurrence records across the Greater Hunter region since 1 January 1990 where duplicate records have been removed.

'The spatial distribution of species observations within the region is highly biased towards populated areas. Therefore, to reduce the influence of these observed biases in the species occurrence data, sampling bias grids were used.

'A set of 18 ecologically-relevant environmental variables were selected as potential predictors of the distribution of threatened species within the region. These included variables describing the climate, vegetation, topography and soils that were available across the entire modelling region at 100 m resolution.

'The predictive power of each model was evaluated using the area under the receiver operator characteristic curve (Hanley and McNeil, 1982), where models with an AUC value of 0.7 or greater were considered to be informative (Swets, 1988b).'

The above text is extracted from: Kujala H, Whitehead AL & Wintle BA (2015). *Excerpt from a report on the biodiversity prioritisation analysis: modelling species and threatened ecological plant communities in the Hunter, Central & Lower North Coast Region of New South Wales,* A report by the NERP Environmental Decisions Hub at The University of Melbourne, Melbourne Victoria.

3. Dataset Attributes

The models are represented as a continuous raster surface, with no attribute table. The values represent the relative likelihood of occurrence with the highest values representing the most likely areas for the occurrence of the species.

4. Limitations and Considerations

This data represents a subset of threatened species across the region, and should not be used to represent all threatened species. The analysis could only include data available at the time of production, therefore is constrained to those sites and parameters.

The occurrence data used in this analysis were obtained from two online databases that combine data from a range of sources, including systematic surveys, museum records and observations by the general public. While the records were cleaned for spatial accuracy to the best of our ability, we were unable to compensate for inaccuracies due to species misidentifications or taxonomic changes. Therefore, it is possible that some inaccurate records were included in the model construction.

The values in each SDM are relative, so they should not be compared to each other. It is recommended that sites highlighted by subsequent analyses as high priority for conservation or at risk from development be surveyed as part of the decision-making process. See full technical report for further details.

PHOTOS: MAX ELLIOT

TABLE 1. TYPES OF THREATENED SPECIES

DESCRIPTION	DEFINITION UNDER THE NPW ACT 1974, THE TSC ACT 1995, THE FM ACT 1994 NO. 38, THE SSDP, THE EPBC ACT 1999, AND/OR THE MIGRATORY BIRDS AGREEMENT
Critically Endangered	Refers to a native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria (Subdivision A of Division 1 of Part 13, Commonwealth EPBC Act 1999).
Endangered	Refers to a native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria (Subdivision A of Division 2 of Part 13, Commonwealth EPBC Act 1999).
Endangered	Refers to fauna and flora species that are likely to become extinct in nature in NSW unless the circumstances and factors threatening its survival or evolutionary developments cease to operate; or, its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction; or, it might already be extinct, but it is not presumed extinct (Schedule 1, part 1, TSC Act 1995).
Endangered Population	Refers to a population where, in the opinion of the Scientific Committee, its numbers have been reduced to such a critical level, or its habitat has been so drastically reduced, that it is in immediate danger of extinction and it is not a population of a species already listed in Schedule 1, and: (a) it is disjunct and at or near the limit of its geographic range, or (b) it is or is likely to be genetically distinct, or (c) it is otherwise of significant conservation value. (Schedule 1, part 2, TSC Act 1995).
Extinct	Refers to fauna and flora species that have not been located in nature during the preceding 50 years despite searching of known and likely habitats of that period (Schedule 1, part 4, TSC Act 1995).
Critically Endangered Species	Refers to a species that is eligible to be listed as a critically endangered species if, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future, as determined in accordance with criteria prescribed by the regulations. (Schedule 1a, part 1, TSC Act 1995).
Category 2 sensitive species	Refers to species for which Atlas sightings' coordinates will be supplied denatured to public web applications, and denatured to licensed clients. Such species are classed as highly sensitive, and provision of precise locations would subject the species to high risk from threats such as disturbance and collection.
Category 3 sensitive species	Refers to species for which sightings' coordinates will be supplied denatured to public web applications, but supplied 'as-held' to licensed clients. Current denaturing specifications are set out in Appendix 2. Such species are classed as of medium sensitivity, and provision of precise locations would subject the species to medium risk from threats such as collection/deliberate damage. Data are supplied under the conditions of a written data agreement, usually a Data Licence Agreement.
CAMBA	China–Australia Migratory Bird Agreement: Refers to species listed in the Bilateral Agreement between the Government of Australia and the Government of the People's Republic of China for the protection of Migratory Birds and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).
JAMBA	Japan–Australia Migratory Bird Agreement: Refers to species listed in the Bilateral Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement: Refers to species listed in the Bilateral Agreement between the Government of Australia and the Government of the Republic of Korea for the protection of Migratory Birds and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).
Protected	Refers to fauna not listed in Schedule 11 of the NPW Act 1974.
Vulnerable	NSW legislation refers to fauna and flora species that are likely to become endangered unless the circumstances & factors threatening its survival or evolutionary development cease to operate (Schedule 2, TSC Act 1995). Federal legislation refers to a native species that is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria (Subdivision A of Division 1 of Part 13, Commonwealth EPBC Act 1999).

5. ANZLIC Metadata Statement

GENERAL PROPERTIES	
File Identifier	5F6BF445-C25A-40B8-9883-0E30CBF55C6B
Hierarchy Level	dataset
Hierarchy Level Name	dataset
Standard Name	ANZLIC Metadata Profile: An Australian/New Zealand Profile of AS/NZS ISO 19115:2005, Geographic information – Metadata
Standard Version	1.1
Date Stamp	2015-06-29
Resource Title	Threatened Species Models: Hunter, Central & Lower North Coast Region, NSW
Format Name	*.xml
Format Version	Unknown
KEY DATES AND LANGUAGES	
Date of creation	2015
Date of publication	2015-06
Metadata Language	eng
Metadata Character Set	utf8
Dataset Languages	eng
Dataset Character Set	utf8
Abstract	This data illustrates the modelled likelihood of occurrence of particular species with levels of legal protection across the Hunter, Central & Lower North Coast region of NSW.
Purpose	This data has been produced to inform environmental management and planning
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JURISDICTIONS	
	Australia
	New South Wales
SEARCH WORDS	
	ECOLOGY-Habitat
	FAUNA-Native
	FLORA-Native

5. ANZLIC Metadata Statement continued

THEMES AND CATEGORIES	
Topic Category	environment
STATUS AND MAINTENANCE	
Status	completed
Maintenance and Update Frequency	
Date of Next Update	
REFERENCE SYSTEM	
Reference System	EPSG::28356 (GDA94 / MGA zone 56)
DATA SCALES/RESOLUTIONS	
Resolution	100 m
SPATIAL REPRESENTATION TYPE	
Spatial Representation Type	grid
DATASET ACCESS CONSTRAINTS	
Identifier	license
Annotation	License available through Hunter Central Coast Regional Management Strategy
DATASET USE CONSTRAINTS	
Identifier	copyright
Annotation	Use of resource must be referenced to University of Melbourne NERP
ADDITIONAL EXTENTS – GEOGRAPHIC	
Identifier	aus
Identifier	NSW_CESSNOCK__C_
Identifier	NSW_DUNGOG__A_
Identifier	NSW_GLOUCESTER__A_
Identifier	NSW_GOSFORD__C_
Identifier	NSW_GREAT_LAKES__A_
Identifier	NSW_GREATER_TAREE__C_
Identifier	NSW_LAKE_MACQUARIE__C_
Identifier	NSW_MAITLAND__C_
Identifier	NSW_MERRIWA__A_
Identifier	NSW_MURRURUNDI__A_
Identifier	NSW_MUSWELLBROOK__A_
Identifier	NSW_NEWCASTLE__C_
Identifier	NSW_PORT_STEPHENS__A_
Identifier	NSW_SCONE__A_
Identifier	NSW_SINGLETON__A_
Identifier	NSW_WYONG__A_

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