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Entoloma bloxamii, Big Blue Pinkgill

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Taxonomy

Kingdom	Phylum	Class	Order	Family
Fungi	Basidiomycota	Agaricomycetes	Agaricales	Entolomataceae

Taxon Name: Entoloma bloxamii (Berk. & Broome) Sacc.

Synonym(s):

• Agaricus bloxamii Berk. & Broome

Common Name(s):

- English: Big Blue Pinkgill, Bloxam's Entoloma
- French: Entolome de Bloxam

Taxonomic Source(s):

Index Fungorum Partnership. 2019. Index Fungorum. Available at: http://www.indexfungorum.org.

Taxonomic Notes:

Entoloma bloxamii (Berk. & Broome) Sacc. has for a long time been treated as one species (e.g. Noordeloos 1992, most distribution maps and red lists). It is now known to comprise several species, as shown by Morgado *et al.* (2013) and Ainsworth *et al.* (2018) including *E. madidum* (Fr.) Gillet. Based on DNA sequencing, we know that Norway has mainly *E. madidum* (*E. bloxamii s.str.* not found), but similar data are lacking for most countries. Because we lack separate information on these species in most countries, they have to be treated temporarily as one, until more information comes available. In N America, S America and Asia there are other similar species.

Assessment Information

Red List Category & Criteria:	Vulnerable A2c+3c+4c <u>ver 3.1</u>			
Year Published:	2019			
Date Assessed:	March 26, 2019			

Justification:

Entoloma bloxamii sensu lato mainly occurs in calcareous semi-natural grasslands, and to a lesser degree (probably <30% of the population) in rich/calcareous forests (like rich broadleaved forests and calcareous pine forests), up to subalpine areas. The habitats are declining due to changing agricultural practices, development projects, mining, forestry and pollution. In grassland habitats we assume a habitat loss and population decline of 30-50% over the past 50 years, probably near 50%. In forests the habitat loss and population decline could be estimated to be 15-20% over the same period. Over the distribution range we assume an average habitat loss and population decline of more than 30% over the last 50 years (approximately three generations: one generation is assumed to be about 17 years). Habitat quality of grasslands has also become impaired and the decline in population size over this time could be even higher because of this, strengthening the assumption of 30-50% population decline. This decline in habitat is ongoing and expected to continue over the next 50 years. GBIF lists more than 800 occurrences from Europe, including duplicates, but due to lacking data in GBIF there could be roughly

1000 known localities. The species is assumed to have a population of more than 20,000 mature individuals. At a global scale (i.e. Europe) the population decline is assumed to be on average 30-50% in 50 years (past, present and future). The species meets the threshold for VU (A2c+3c+4c).

Geographic Range

Range Description:

Entoloma bloxamii s. lat. is known from most European countries, from the lowlands up to subalpine areas, but mostly rare to very rare. Scandinavia, UK and Germany have the largest known populations. Eastwards the distribution limit is uncertain because of lack of data; in Russia only known from the northwest (Novgorod region).

Country Occurrence:

Native: Austria; Belarus; Belgium; Croatia; Cyprus; Czechia; Denmark; Estonia; France; Germany; Greece; Hungary; Ireland; Italy; Lithuania; Luxembourg; Netherlands; Norway; Portugal; Russian Federation; Serbia; Slovakia; Spain; Sweden; Switzerland; Ukraine; United Kingdom

Possibly extinct: Poland

Distribution Map

Entoloma bloxamii



Range

Extant (resident)

Compiled by: IUCN





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The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

Population

National databases and GBIF (2019) indicate roughly 1000 occurrences from Europe. Seminatural grasslands are strongly declining. Griffith et al. (2013) estimated a habitat loss of 90% over the last 75 years for the CHEG-fungi (grassland fungi of Clavariaceae, Hygrocybe s.l., Entoloma and Geoglossaceae) as a whole in Western Europe (i.e. loss in seminatural grasslands, based on available information). According to the Food and Agriculture Organization of the United Nations (FAO 2006), the area of grasslands in the EU declined by 12.8% over 13 years (1990-2003). Also other sources point to a habitat loss in seminatural grasslands of roughly 1% per year in Europe over a longer time, although the data quality is not always very good. In grassland habitats we therefore assume a habitat loss of 30-50% over the past 50 years, probably near 50%. The habitat quality of seminatural grasslands is also declining, strengthening the assumption of a high population decline. More than 75% of the grasslands habitats are in an unfavourable conservation status (http://ec.europa. eu/environment/nature/knowledge/ rep_habitats/index_en.htm#csa). In forests the habitat loss and population decline could be estimated to 15-20% over the same period. Over the distribution range we assume a total habitat loss and population decline of >30% over the last 50 years (approximately three generations: one generation is assumed to be about 17 years). This decline in habitat is ongoing and expected to continue. Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

Entoloma bloxamii s. lat. grows in calcareous, mycologically rich but nutrient-poor semi-natural grasslands and to a lesser degree (probably <30% of the population) in rich/calcareous forests (such as rich broadleaved forests and calcareous pine forests). In Norway, the habitat selection has been quantified: N=115; 67% in seminatural grasslands, and 27% in rich forests (Jordal *et al.* 2016), and similar patterns are found in other European countries. For instance, it is not a strictly meadow species in the Iberian Peninsula where it occurs in *Quercus ilex* forests on calcareous ground and also in *Quercus suber* forests on acidic ground. In the Iberian Peninsula it is in clear decline in meadows, but still relatively common in some forest areas (Olariaga Ibarguren, I. pers. comm.). It is found from the sea up to subalpine areas in Scandinavia and in the Alps. The nutrient strategy is unknown, but all "CHEG-fungi" (see above) could have some kind of biotrophy or mycorrhiza (cf. Griffith 2004). The fruit bodies are short-lived (weeks), but the mycelium is suspected to be longlived; >50-100 years.

Systems: Terrestrial

Use and Trade

The species is not known to be used.

Threats (see Appendix for additional information)

Habitat destruction and abandonment are the main threats to seminatural grasslands. The most important process is probably overgrowing due to ceased grazing/mowing of old seminatural grasslands as part of intensification of agriculture. Further modern cultivation methods like use of fertilizers, pesticides and ploughing. Also some places changed land use with the construction of roads, industrial areas, settlements etc. The latter factors can influence localities in forests, where also modern forestry can be a threat. Decline is expected to continue, as at least the areas of seminatural grasslands are of

little economic importance in modern agriculture. Most CHEG grasslands (see Population and trends) are among types assessed as VU, EN or CR in the EU Red List of habitats (Janssen *et al.* 2016).

Conservation Actions (see Appendix for additional information)

The habitats should be protected against destruction due to intensification of agriculture or development plans. The maintaining of seminatural grasslands demands yearly grazing or mowing. If grazing by heavy animals destroys part of the soil, light animals like sheep should be recommended. Habitat conservation by governmental support to traditional agricultural practices is most important, this exists in many countries to maintain extensive areas of agricultural areas, and should be extended to larger areas than today. Mining and development projects should be avoided. There is a conservation action plan for this species in Sweden (Jordal 2011) and it is a conservation priority species in England, Scotland, Wales and Northern Ireland.

Further ecological research is needed to clarify the nutrient strategy of grassland *Entoloma* species. Management plans are needed. Habitat trends should be monitored.

Credits

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External Resources

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Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.1. Forest - Boreal	-	Suitable	-
1. Forest -> 1.4. Forest - Temperate	-	Suitable	-
4. Grassland -> 4.4. Grassland - Temperate	-	Suitable	-

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	-	-	-
1. Residential & commercial development -> 1.2. Commercial & industrial areas	Ongoing	-	-	-
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.3. Agro-industry farming	Ongoing	-	-	-
3. Energy production & mining -> 3.2. Mining & quarrying	Ongoing	-	-	-
4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	-	-	-
9. Pollution -> 9.3. Agricultural & forestry effluents -> 9.3.3. Herbicides and pesticides	Ongoing	-	-	-
9. Pollution -> 9.5. Air-borne pollutants -> 9.5.1. Acid rain	Ongoing	-	-	-

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed
1. Land/water protection -> 1.1. Site/area protection
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.3. Habitat & natural process restoration
4. Education & awareness -> 4.3. Awareness & communications

Conservation Actions Needed

6. Livelihood, economic & other incentives -> 6.4. Conservation payments

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed

1. Research -> 1.1. Taxonomy

1. Research -> 1.2. Population size, distribution & trends

1. Research -> 1.3. Life history & ecology

2. Conservation Planning -> 2.2. Area-based Management Plan

3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Habitats and Ecology

Generation Length (years): 17

The IUCN Red List Partnership



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