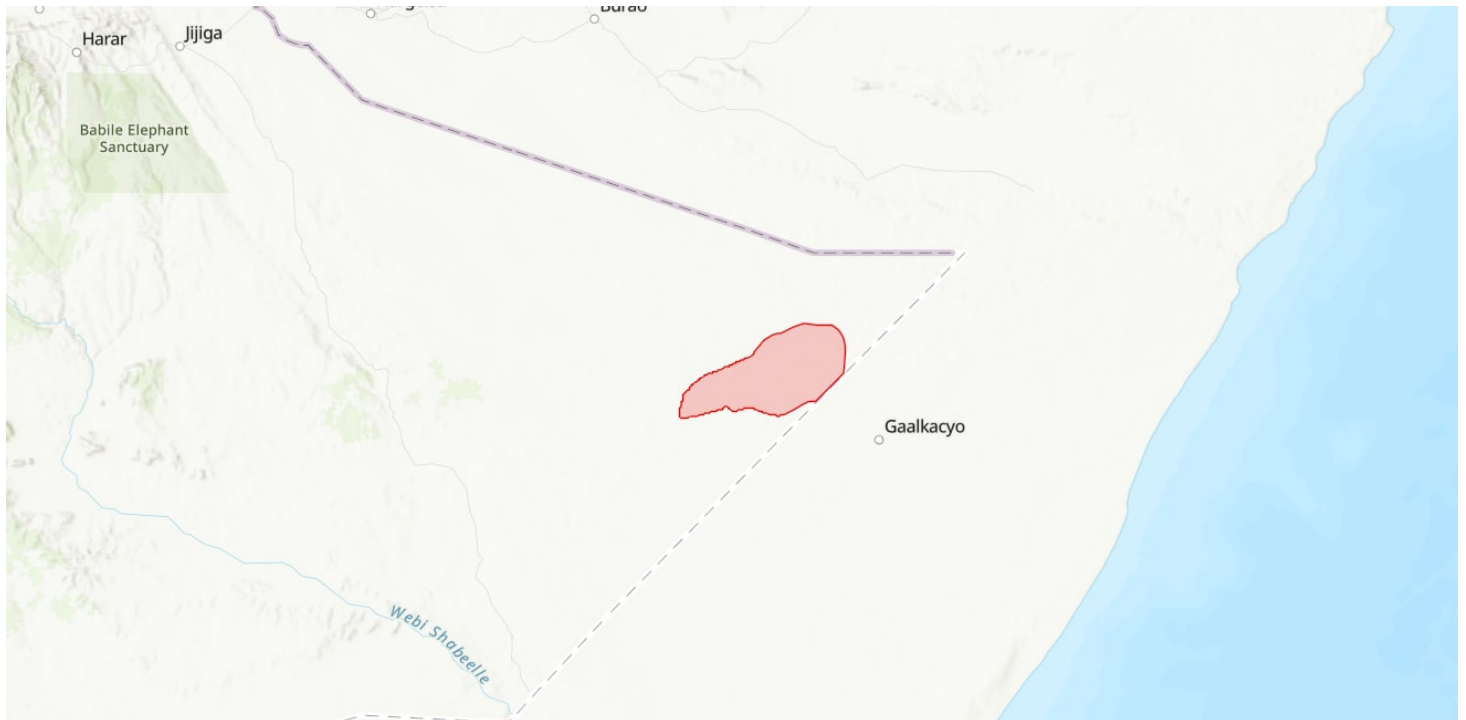


# Bokh

ETHTIPA012



Country: Ethiopia

Administrative region: Somali (Regional State)

Central co-ordinates: 7.18700 N, 46.71900 E

Area: 5061km<sup>2</sup>

## Qualifying IPA criteria

A(i)

## IPA assessment rationale

This site qualifies as an IPA under criterion A(i) due to the presence of two globally threatened species: the socio-economically important tree, *Cordeauxia edulis* (EN), for which this IPA is a key locality and one of the last remaining sites globally; and *Merremia warderensis* (CR), for which this site is the only known locality, based on one georeferenced herbarium voucher in the southwestern corner of the IPA, suggesting high site irreplaceability. While further botanical exploration in the region may reveal a more widespread distribution for *Merremia warderensis*, this site is of global importance for the species.

## Site description

The Bokh IPA is situated in the Dollo Zone (previously known as the

Warder Zone) of Somali Regional State, in the eastern Ethiopian lowlands. It extends across three woredas (districts), namely Bokh, Galadin and Galhamur, and lies approximately 450 km southeast of Jijiga, the capital city of Somali Regional State. Specifically, the IPA borders the towns of Geladin to the south, and Jiracle and Boh to the north, the latter being an important trading centre for local communities and the surrounding areas (Yusuf et al., 2013a).

There are a number of small villages within Bokh IPA, and the eastern part of the site runs parallel to the Ethiopia-Somalia border. Gaalkayo, Somalia's third-largest city, is located approximately 50 km southeast of the IPA. The Bokh area is one of only two regions thought to still contain the globally threatened tree species, *Cordeauxia edulis* (EN), which has drastically declined in recent decades and is threatened by livestock farming, resource overexploitation and climate change (Drechsel & Zech, 1988; Beech et al., 2018).

## Botanical significance

Bokh IPA is situated in the Ogaden, a floristically underexplored territory in eastern Ethiopia, attributable to decades of security issues and socio-political tensions (Sebsebe & Dioli, 2000; Mabberley, 2009). Across the Ogaden, the abundance of endemic plant species is thought to be higher than in most other areas of Ethiopia, with great potential for the discovery of new species (Dioli, 2002; Thulin, 2011; cited in Thulin & Vollesen, 2015; Friis et al., 2016).

The IPA is a key locality for the socio-economically important tree, *Cordeauxia edulis* (EN), locally known as Yeheb (Drechsel & Zech, 1988; Mekonnen et al., 2010; Yusuf et al., 2013b; Seyoum & Mekbib, 2014; Beech et al., 2018). This species was once widespread throughout the Ogaden, extending into central Somalia, but by 1988 the species' distributional range had declined significantly, with only two known localities in Ethiopia - the Werder and Bokh regions (Drechsel & Zech, 1988). The current distribution of *Cordeauxia edulis* in Ethiopia may, in fact, now be restricted to the Bokh region (Mekonnen et al., 2010; Yusuf et al., 2013b; Sebsebe Demissew, pers. comm.). Fieldwork in June 2021 revealed the presence of *Cordeauxia edulis* at six sites within the IPA: near Mirafadle Kebele, Gambarey, Maned Kebele, Dabhabalan Kebele, Foya adde Kebele and Shilinbur (Abubaker et al., 2021).

The endemic geophyte, *Merremia warderensis* (CR), is also known to occur in the surrounding areas, supported by a herbarium voucher from the southwestern corner of the IPA (Sebsebe, 2001). Further fieldwork is required to determine the abundance and distribution of this species.

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## Habitat and geology

The topology of the IPA is characterised by desert to semi-desert lowlands. White (1983) and Friis et al. (2010) categorised the area as a mix of *Acacia-Commiphora* woodland and bushland, and desert and semi-desert scrubland. Land cover within the IPA consists of Haud-type mixed bushland (*Acacia-Commiphora*), open scrubland and grassland, rocky outcrops and urban areas. The *Acacia-Commiphora* bushland, also referred to as Haud-type mixed bushland by Drechsel & Zech (1988), varies from thickets to low open scrub, dominated by drought resistant and semi-succulent species. Open grassland is dominated by *Aristida kelleri*, *Aristida paoliana* and *Stipagrostis uniplumis* (Hemming, 1966; Drechsel & Zech, 1988). Other grasses include *Cenchrus ciliaris*, *Cenchrus stramineus*, *Dactyloctenium scindicum*, *Digitaria rivae*, *Eragrostis papposa*, *Leptothrium senegalense*, *Tetrapogon cenchriformis* and *Tetrapogon roxburghiana* (Hemming, 1966).

In addition to *Cordeauxia edulis*, scattered thickets across the Bokh region comprise *Albizia anthelmintic* (LC), *Balanites rotundifolia* var. *scillina*, *Cordyla somalensis* (NT), *Delonix baccal*, *Euphorbia cuneata* (LC), *Fagonia lahovari*, *Gyrocarpus hababensis*, *Indigofera ruspoli*, *Senna italica*, *Sesamothamnus rivae*, *Terminalia orbicularis*, *Vachellia (Acacia) horrida*, *Vachellia (Acacia) tortilis* (LC) and various species of *Boswellia*, *Commiphora*, *Cordia* and *Grewia* (Hemming, 1966; Drechsel & Zech, 1988; Yusuf et al., 2013b). Where *Cordeauxia edulis* is locally abundant, the density of other tree species appears to be relatively low, whereas in areas where Yeheb has been locally overexploited (for instance, the villages of Foye ade, Maned and Dabhabalan), other species begin to dominate (Abubaker et al., 2021). These include *Acacia horrida*, *Acacia tortilis* (LC), *Boswellia microphylla*, *Boswellia neglecta*, *Cassia obovata*, *Cordia africana*

(LC), *Euphorbia cuneata* (LC), *Indigofera ruspoli*, *Terminalia orbicularis* and a number of *Commiphora* species (Abubaker et al., 2021).

Lithologically, the area is dominated by the Bokh formation, comprising shale interbedded with sandstone and siltstone (Worku & Astin, 1992; JICA, 2013; Oljira et al., 2020). Gypsum and limestone outcrops are also widely exposed in the Bokh and Galadi woredas (Hemming, 1966; Drechsel & Zech, 1988; JICA, 2013). According to Drechsel & Zech (1988), soil within the IPA is characteristic of the Haud, consisting of red sandy soil, with a high rainwater filtration rate, derived from the Jesomma formation. The red soils of the Galadin woreda are often deeper, with traces of lime (Drechsel & Zech, 1988). Petric and haplic gypsosols also occur.

The climate of the Bokh area is arid, part of the Bereha climatic zone (Mege et al., 2015), with a mean annual temperature of 28 C (Yusuf et al., 2013b). Rainfall is bimodal with two rainy seasons (March-May and October-November), and two prolonged dry periods (Drechsel & Zech, 1988; Seyoum & Mekbib, 2014). Mean annual rainfall varies from 150-250 mm (Drechsel & Zech, 1988; Yusuf et al., 2013b).

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## Conservation issues

There is currently no site protection or biodiversity management plan within the IPA, nor does the IPA overlap with an Important Bird Area or Key Biodiversity Area. This is perhaps, in part, a result of the socio-political tensions and territorial disputes that have presided over the region for many years, hampering botanical exploration and conservation efforts (Hogg, 1991; Mabberley, 2009; Mohamed & Iman, 2010; Mohamed, 2013). The region is also prone to prolonged periods of drought, likely exacerbated by increasing weather unpredictability and climate change. *Cordeauxia edulis* is considered to be relatively drought resistant and desertification tolerant (Yusuf et al., 2013; Abubaker et al., 2021), but it remains unclear how future climatic changes will affect the species.

Overgrazing from livestock is the main threat to Bokh IPA and its floristic diversity. Over 85% of the human population across the Ogaden are pastoralists (Yusuf et al., 2013a), exerting significant pressures on the region's natural habitat. The globally threatened species, *Cordeauxia edulis* (EN), has declined by 50% over just three generations (less than 180 years) due to overexploitation by local communities, overgrazing and severe droughts (Thulin & Vollesen, 2015; Beech et al., 2018).

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## Site assessor(s)

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## IPA criterion A species

SPECIES	QUALIFYING SUB-CRITERION	≥ 1% OF GLOBAL POPULATION	≥ 5% OF NATIONAL POPULATION	1 OF 5 BEST SITES NATIONALLY	ENTIRE GLOBAL POPULATION	SOCIO-ECONOMICALLY IMPORTANT	ABUNDANCE AT SITE
<i>Cordeauxia edulis</i> Hemsl.	A(i)	✓	✓	✓	—	✓	Frequent
<i>Merremia warderensis</i> Sebsebe	A(i)	✓	✓	✓	—	—	Unknown

## IPA criterion C qualifying habitats

HABITAT	QUALIFYING SUB-CRITERION	≥ 5% OF NATIONAL RESOURCE	≥ 10% OF NATIONAL RESOURCE	1 OF 5 BEST SITES NATIONALLY	AREAL COVERAGE AT SITE
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## General site habitats

GENERAL SITE HABITAT	PERCENT COVERAGE	IMPORTANCE
Savanna - Dry Savanna	—	Major
Shrubland - Subtropical/Tropical Dry Shrubland	—	Major
Grassland - Subtropical/Tropical Dry Lowland Grassland	—	Major
Desert - Hot Desert	—	Major
Rocky Areas	—	Minor
Artificial - Terrestrial - Pastureland	—	Major
Artificial - Terrestrial - Urban Areas	—	Minor

## Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Agriculture (pastoral)	—	Major
Harvesting of wild resources	—	Major
Residential / urban development	—	Minor

## Threats

THREAT	SEVERITY	TIMING
Human intrusions & disturbance - War, civil unrest & military exercises	Unknown	Past, not likely to return
Agriculture & aquaculture - Livestock farming & ranching - Nomadic grazing	High	Ongoing - trend unknown

THREAT	SEVERITY	TIMING
Agriculture & aquaculture - Livestock farming & ranching - Small-holder grazing, ranching or farming	High	Ongoing - trend unknown
Biological resource use - Gathering terrestrial plants	High	Ongoing - trend unknown
Climate change & severe weather - Droughts	High	Ongoing - trend unknown

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