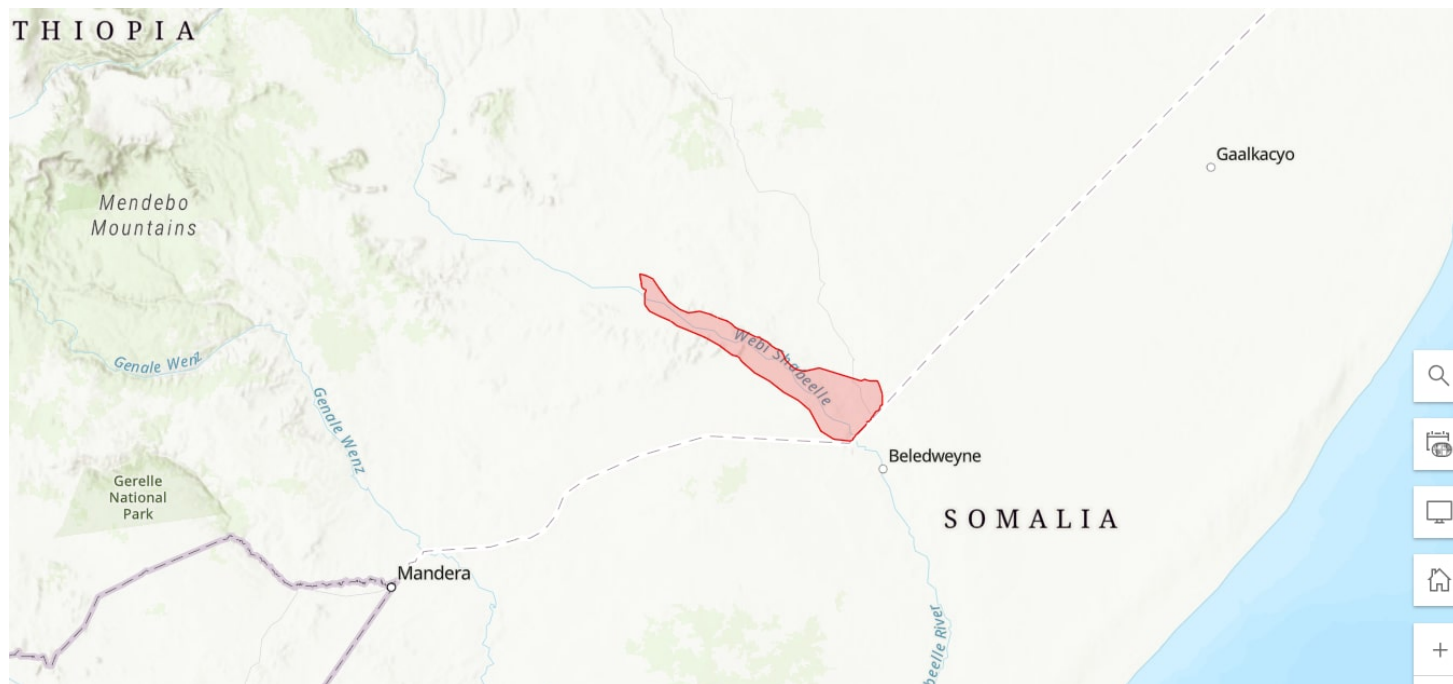


Lower Wabi Shebelle

ETHTIPA010



Country: **Ethiopia**

Administrative region: **Somali (Regional State)**

Central co-ordinates: **5.49616 N, 44.34613 E**

Area: **4935km²**

Qualifying IPA criteria

A(i)

IPA assessment rationale

The Lower Wabi Shebelle qualifies as an IPA under criterion A(i) due to the presence of eight globally threatened species. The IPA is a key locality for *Boswellia ogadensis* (CR), *Euphorbia piceoides* (CR), *Euphorbia suborbicularis* (CR), *Kleinia isabellae* (CR), *Senegalia pseudonigrescens* (CR), *Euphorbia ogadenensis* (EN), *Orthosiphon grandiflorus* (EN) and *Blepharis gypsophila* (VU). At least seven of these species are only known to occur within the IPA, suggesting high site irreplaceability. The eighth (*Senegalia pseudonigrescens*) has one potential occurrence record just north of the IPA, although there are no herbarium vouchers to support this human observation. Either way, this site also represents a globally important locality for *Senegalia pseudonigrescens*. Further research is needed to understand the range of *Cordeauxia edulis* (EN) and confirm its presence in this IPA. Livestock overgrazing, population growth and agricultural development schemes all pose significant threats to these species and the area's wider vegetation and natural habitats.

Site description

The Lower Wabi Shebelle IPA is situated in the Harerege and Bale floristic regions of Somali Regional State, in the southeast Ethiopian lowlands (Friis et al., 2010). The Wabi Shebelle River originates in the Bale Mountains and is one of the country's major rivers. In the eastern part of the IPA, the Ferfer River (the main seasonal tributary) joins the Wabi Shebelle River (BirdLife, 2024). The IPA also encompasses a number of towns and villages, including Kelafo and Mustahil, and borders the town of Gode to the west and the national border with Somalia to the east. The Wabi Shebelle River actually extends into Somalia towards Mogadishu, before turning south and, during seasonally wet periods, joining the Jubba River near its mouth in southern Somalia.

Botanical significance

The Ogaden region, within which the Lower Wabi Shebelle IPA resides, is one of the most floristically underexplored areas in Ethiopia due to accessibility and security issues over recent decades, attributable to drought, famine, violence and other socio-political tensions (Mabberley, 2009; Majid et al., 2022). The IPA and its surrounding areas are thought to have a high potential for the discovery of new endemic species, especially succulent species and those associated with gypsum and limestone outcrops (Sebsebe & Dioli, 2000; Thulin & Vollesen, 2015). In the Ogaden region, the abundance and diversity of endemic floristic species is thought to be relatively high compared to other regions in Ethiopia (Thulin, 2011;

cited in Thulin & Vollesen, 2015).

Despite the lack of botanical exploration across the region, the Lower Wabi Shebelle IPA is known to be a key locality for eight globally threatened endemic species, namely the tree species, *Boswellia ogadensis* (CR), *Euphorbia piceoides* (CR), *Senegalia (Acacia) pseudonigrescens* (CR) and *Euphorbia ogadenensis* (EN), the shrubs, *Kleinia isabellae* (CR) and *Blepharis gypsophila* (VU), and the subshrubs, *Euphorbia suborbicularis* (CR) and *Orthosiphon grandiflorus* (EN). The IPA is thus an important site for five Critically Endangered species and the only known locality for seven of the eight globally threatened species. Given the lack of botanical exploration in the region, however, further fieldwork campaigns could reveal a more widespread distribution for some of these species (Dioli, 2002; Thulin, 2009; Thulin & Vollesen, 2015).

The globally threatened and socio-economically important endemic evergreen shrub species, *Cordeauxia edulis* (EN), was also noted in the KBA and IBA assessments of the Lower Wabi Shebelle River and Warder, although it is likely present in Warder rather than along the Lower Wabi Shebelle River (Key Biodiversity Areas, 2024; BirdLife, 2024). The presence of *Cordeauxia edulis* thus needs to be confirmed as its natural distribution is not thought to extend as far south as the Wabi Shebelle region (Yusuf et al., 2013), and there are no supporting herbarium vouchers within the IPA. Also of note is the locally abundant endemic tree, *Acacia fumosa* (LC), which is believed to occur within the IPA (Thulin & Vollesen, 2015).

Habitat and geology

The IPA is characterised by arid lowlands, as well as floodplains and seasonal tributaries associated with the Wabi Shebelle river (BirdLife, 2024). Friis et al. (2010) categorised the Wabi Shebelle Valley as desert and semi-desert scrubland with intermittent wetlands and salt-lake shore vegetation, dominated by drought-tolerant species (Asefa et al., 2020). Land cover within the IPA consists of *Acacia-Commiphora* deciduous bushland and thickets, grassland, rocky limestone and gypsum outcrops, succulent scrub, wetlands, irrigated agricultural fields and urban areas (Thulin, 2009; Thulin & Vollesen, 2015; Friis et al., 2016). Periodic flooding occurs between Kelafo and Ferfer about twice a year, forming a large flood zone (Segalen, 1973; De Sole et al., 1978; BirdLife, 2024).

Frequently encountered flora include the tree and shrub species, *Acacia fumosa*, *Cadaba divaricata*, *Gossypium bricchettii*, *Jatropha rivae*, *Pleuropterantha revoilii* and several species of *Commiphora*, the succulent subshrub, *Euphorbia polyantha*, and the perennial herb, *Indigofera gypsacea* (Segalen, 1973; Thulin, 2009; Thulin & Vollesen, 2015). Additionally, the Ferfer and Mustahil wordas (districts), located in the eastern part of the IPA, contain a halophytic community of *Bolboschoenus maritimus*, *Cenchrus biflorus*, *Cucumis kelleri* and *Urochondra setulosa* (Segalen, 1973; BirdLife, 2024). Grass species dominate the floodplains (BirdLife, 2024).

The lithology of the area is characterised by sedimentary rock dating back to the Early Cretaceous, mainly Korahe gypsum and Mustahil limestone (Persits et al., 2002; JICA, 2013). The gypsum outcrops form flat to undulating land, intersected by a network of rivers and streams, while alluvial deposits are found throughout the IPA (Segalen, 1973; JICA, 2013; BirdLife, 2024). Soils are predominantly calcareous fluvisols, haplic calcisols and haplic gypsisols, although leptisols and vertisols also occur (Jones et al., 2013). The Wabi Shebelle River reportedly has a high saline content (Mohamed, 2013), and salt tends to accumulate in the drier areas of the IPA, between Kelafo and Ferfer (Segalen, 1973).

The climate of the Lower Wabi Shebelle region is arid. The mean annual temperature for Gode is 28 C, with an average humidity of 55% (Segalen, 1973; De Sole et al., 1978). Rainfall is bimodal with two rainy seasons in March-May and October-November (De Sole et al., 1978). Mean annual rainfall varies across the IPA, ranging from 170-210 mm at Kelafo to 335 mm at Gode (Bauduin, 1973; Segalen, 1973).

Conservation issues

There is currently no site protection or management plan in place within the IPA. The IPA overlaps with the eastern section of the Lower Wabi Shebelle and Warder Important Bird Area (IBA) and Key Biodiversity Area (KBA). The IBA was identified under criteria A1, A2 and A3, due to the occurrence of 47 bird species, all now categorised as Least Concern on the IUCN Red List, with the exception of *Heterotetrax humilis* (little brown bustard, NT), *Streptopelia reichenowi* (white-winged collared dove, NT) and *Sylvietta philippae* (Philippa's crombec, DD) (BirdLife, 2024). Its KBA status was determined based on the IBA assessment and is a priority for reassessment under the current Global KBA Standard, since it has not been evaluated since its original assessment in 1996 (Key Biodiversity Areas, 2024).

As aforementioned, the IPA and wider Ogaden region have been underexplored floristically due to relative inaccessibility, caused by poor infrastructure and security issues (Sebsebe & Dioli, 2000; Mabberley, 2009). Severe droughts, floods, periodic famine, territorial wars and a tense political climate have all contributed to socio-political instability in the region (Hogg, 1991; Mohamed & Iman, 2010; Mohamed, 2013; OCHA, 2020), unsurprisingly inhibiting conservation efforts. Pastoralism is the primary livelihood and income-generating activity in the area, resulting in overgrazing by livestock and natural habitat degradation across the IPA (Thulin & Vollesen, 2015). The main livestock are cattle, sheep, goats, and camels (De Sole et al., 1978). The threatened endemics of the IPA are vulnerable to this intense grazing pressure (Alemu et al., 2018a, 2018b, 2018c; Nemomissa et al., 2018).

Other potential threats to the Lower Wabi Shebelle IPA and its flora include agricultural development schemes and increasing populations (Key Biodiversity Areas, 2024; BirdLife, 2024). Irrigation

along the Wabi Shebelle River began in the 1960s, coinciding with the creation of a research centre aiming to assess the 'suitability for large-scale irrigated crop farming' (Livestock, Crop and Rural Development Bureau, 2013). Irrigation in the 1960s and 1970s was mainly limited to the Kelafo region, downstream from Gode (Bauduin, 1973), but increased under the Derg regime (Livestock, Crop and Rural Development Bureau, 2013). Now, irrigated agricultural fields can be observed all along the Wabi Shebelle River, aided by diesel pumps (Livestock, Crop and Rural Development Bureau, 2013). A large scale, government run, gravity irrigation scheme in West Gode was established in the early 2000s. Construction began during the mid 1990s, with 1000 ha developed by 2001 and a further 2000 ha by 2006 (Livestock, Crop and Rural Development Bureau, 2013). Crop diversification was introduced in 2008, however by 2010 production had declined due to high levels of siltation and canal damage, resulting in the scheme being suspended. In 2013, the Somali Regional State government made plans to revive the West Gode gravity irrigation project, although the current status of the project is unclear.

In 2001, a dam was constructed near Gode as part of irrigation development (Mohamed & Iman, 2010). According to Mohamed (2014), future major development plans for the Wabi Shebelle River include 141 irrigation schemes and six large dams as part of the Wabi Shebelle River Basin Master Plan (2005-2035). The irrigation potential of the Wabi Shebelle River has been estimated to be 204,000 ha (Mohamed, 2013).

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>Boswellia ogadensis</i> <i>Vollesen</i>	A(i)	✓	✓	✓	✓	—	Unknown
<i>Acacia pseudonigrescens</i> <i>Brenan & J.H.Ross</i>	A(i)	✓	✓	✓	—	—	Unknown
<i>Euphorbia ogadenensis</i> <i>P.R.O.Bally & S.Carter</i>	A(i)	✓	✓	✓	✓	—	Unknown
<i>Euphorbia piceoides</i> <i>Thulin</i>	A(i)	✓	✓	✓	✓	—	Unknown
<i>Kleinia isabellae</i> <i>Dioli & Mesfin</i>	A(i)	✓	✓	✓	✓	—	Unknown
<i>Euphorbia suborbicularis</i> <i>Thulin</i>	A(i)	✓	✓	✓	✓	—	Unknown
<i>Orthosiphon grandiflorus</i> <i>A.Terracc.</i>	A(i)	✓	✓	✓	✓	—	Unknown
<i>Blepharis gypsophila</i> <i>Thulin & Vollesen</i>	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
Wetlands (inland) - Permanent Rivers, Streams, Creeks [includes waterfalls]	—	Major
Shrubland - Subtropical/Tropical Dry Shrubland	—	Major
Grassland - Subtropical/Tropical Dry Lowland Grassland	—	Major
Artificial - Terrestrial - Urban Areas	—	Minor
Artificial - Terrestrial - Arable Land	—	Major
Artificial - Terrestrial - Pastureland	—	Major
Rocky Areas	—	Major

GENERAL SITE HABITAT	PERCENT COVERAGE	IMPORTANCE
Desert - Hot Desert	—	Major
Grassland - Subtropical/Tropical Seasonally Wet/Flooded Lowland Grassland	—	Major

Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Agriculture (arable)	—	Major
Agriculture (pastoral)	—	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 - Annual & perennial non-timber crops	Unknown	Ongoing - increasing
Agriculture & aquaculture - Livestock farming & ranching - Nomadic grazing	High	Ongoing - trend unknown
Agriculture & aquaculture - Livestock farming & ranching - Small-holder grazing, ranching or farming	High	Ongoing - trend unknown
Climate change & severe weather - Droughts	Unknown	Ongoing - trend unknown
Natural system modifications - Dams & water management/use	Medium	Ongoing - trend unknown

Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Lower Wabi Shebelle River and Warder IBA	Important Bird Area	protected/conservation area overlaps with IPA	4398
Lower Wabi Shebelle River and Warder KBA	Key Biodiversity Area	protected/conservation area overlaps with IPA	4398

Management type

MANAGEMENT TYPE	DESCRIPTION	YEAR STARTED	YEAR FINISHED
No management plan in place		—	—

Bibliography

Jones, A., Breuning-Madsen, H., Brossard, M., Dampha, A., Deckers, J., Dewitte, O., Gallali, T., Hallett, S., Jones, R., Kilasara, M., Le Roux, P., Micheli, E., Montanarella, L., Spaargaren, O., Thiombiano, L., Van Ranst, E., Yemefack, M. & Zougmore R. 2013. **Soil Atlas of Africa.**

Friis, I., Sebsebe Demissew, & van Breugel, P. 2010. **Atlas of the Potential Vegetation of Ethiopia.**

Alemu, S., Alemu, S., Atnafu, H., Tesfaye Awas, Belay, B., Sebsebe Demissew, Luke, W.R.Q., Mekbib, E., Nemomissa, S., & Bahdon, J. 2018a. **Boswellia ogadensis.** The IUCN Red List of Threatened Species 2018: e.T34385A128140745.

Alemu, S., Alemu, S., Atnafu, H., Tesfaye Awas, Belay, B., Sebsebe Demissew, Luke, W.R.Q., Mekbib, E., & Nemomissa, S. 2018b. **Euphorbia ogadenensis.** The IUCN Red List of Threatened Species 2018: e.T34387A128380167.

Alemu, S., Alemu, S., Atnafu, H., Tesfaye Awas, Belay, B., Sebsebe Demissew, Luke, W.R.Q., Mekbib, E., & Nemomissa, S. 2018c. **Euphorbia piceoides.** The IUCN Red List of Threatened Species 2018: e.T128045317A128045327.

Asefa, M., Cao, M., He, Y., Mekonnen, E., Song, X., & Yang, J. 2020. **Ethiopian vegetation types, climate and topography.** Plant Diversity, Vol 42, page(s) 302-311

Bauduin, K. 1973. **Wabi Shebelle Survey: Hydrological Survey of the Wabi Shebelle Basin.**

BirdLife 2024. **Important Bird Areas factsheet: Lower Wabi Shebelle river and Warder.**

Dioli, M. 2002. **Two new species of Pseudolithos P. R. O. Bally (Apocynaceae-Asclepiadoideae) from the Horn of Africa.** Kew Bulletin, Vol 57, page(s) 985-988

Friis, I. Gilbert, M.G., Weber, O., & Sebsebe Demissew. 2016. **Two distinctive new species of Commicrapus (Nyctaginaceae) from gypsum outcrops in eastern Ethiopia.** Kew Bulletin, Vol 72, page(s) 34

Hogg, R. 1991. **Famine in the Ogaden.** Disasters, Vol 15(3), page(s) 271-273

JICA 2013. **The Study on Jarar Valley and Shebele Sub-basin Water Supply Development Plan, and Emergency Water Supply in the Federal Democratic Republic of Ethiopia. Final Report (2/7), Volume 1: Survey on the potential water resources (groundwater) utilization.**

Key Biodiversity Areas 2024. **Key Biodiversity Areas factsheet: Lower Wabi Shebelle river and Warder.**

Livestock, Crop and Rural Development Bureau 2013. **The Lower**

Shebelle Irrigation Scheme in Ethiopia: An assessment of productive options.

Mabberley, D.J. 2009. **Exploring Terra Incognita.** Science, Vol 324, page(s) 472

Mohamed, A.E. 2013. **Managing shared river basins in the Horn of Africa: Ethiopian planned water projects on the Juba and Shabelle rivers and effects on downstream uses in Somalia.** WIT Transactions on Ecology and The Environment, Vol 172, page(s) 139-151

Mohamed, A.E. 2014. **Comparing Africa's Shared River Basins – The Limpopo, Orange, Juba and Shabelle Basins.** Universal Journal of Geoscience, Vol 2(7), page(s) 200-211

Mohamed, A.E. & Iman, H.M. 2010. **'Hydropolitics in the Horn of Africa: Conflicts and Cooperation in the Juba and Shabelle Rivers.'** in Calas, B. & Martinon, C.A.M. **Shared Waters, Sharded Opportunities: Hydropolitics in East Africa.**

Nemomissa, S., Luke, W.R.Q., Tesfaye Awas, Atnafu, H., Alemu, S., Alemu, S., Belay, B., Sebsebe Demissew, & Mekbib, E. 2018. **Acacia pseudonigrescens.** The IUCN Red List of Threatened Species 2018: e.T34388A128446172.

OCHA 2020. **Ethiopia: Floods. Situation Report.**

Persits, F., Ahlbrandt, T., Tuttle, M., Charpentier, R., Brownfield, M., & Takahashi, K. 2002. **Map showing geology, oil and gas fields and geologic provinces of Africa, Ver 2.0.** USGS Open File report 97-470 A.

Segalen, M. 1973. **Wabi Shebelle Survey: The Soils of the Wabi Shebelle Basin.**

De Sole, G., Lemma, A., & Mazengia, B. 1978. **Schistosoma haematobium in the Wabi Shebelle Valley of Ethiopia.** American Journal of Tropical Medicine and Hygiene, Vol 27(5), page(s) 928-930

Teshale, T. 2020. **Tourism Potentials and Challenges of the Somali Region, Ethiopia.** Journal of Tourism & Hospitality, Vol 9, page(s) 447

Thulin, M. 2009. **New species of Euphorbia (Euphorbiaceae) from eastern Ethiopia.** Kew Bulletin, Vol 64, page(s) 469

Thulin, M. & Vollesen, K. 2015. **Blepharis gypsophila (Acanthaceae), a new species from Ethiopia.** Kew Bulletin, Vol 70, page(s) 26

Yusuf, M., Teklehaimanot, Z., & Gurmu, D. 2013. **The decline of the vulnerable yeheb Cordeauxia edulis, an economically important dryland shrub of Ethiopia.** Oryx, Vol 47(1), page(s) 54-58

Majid, N., Abdirahman, K. & Daar, A.S. 2022. **Ethiopia's Somali region: between drought and unrest.**

Sebsebe Demissew & Dioli, M. 2000. **A new Aloe (Aloaceae) species from the Ogaden (Southeastern Ethiopia).** Kew Bulletin, Vol 55, page(s) 679-682