

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA



Nineteenth meeting of the Conference of the Parties
Panama City (Republic of Panama), 14 - 25 November 2022

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Inclusion of all African populations of ***Afzelia africana***, ***A. bipindensis***, ***A. pachyloba*** and ***A. quanzensis*** in Appendix II, in accordance with Article II, Paragraph 2 (a) of the Convention and satisfying Criterion B of Annex 2 a of Resolution Conf. 9.24 (Rev. CoP17) and, because of their similarity, all other African populations of the genus *Afzelia* in Appendix II, in accordance with Article II, Paragraph 2 (b) of the Convention and satisfying Criterion A of Annex 2 b of Resolution Conf. 9.24 (Rev. CoP17).

Annotation

#17 Designates logs, sawn wood, veneer sheers, plywood and transformed wood.

B. Proponent

Benin, Côte d'Ivoire, European Union, Liberia and Senegal*

C. Supporting statement

1. Taxonomy

1.1 Class: Magnoliopsida

1.2 Order: Fabales

1.3 Family: Leguminosae

1.4 Genus, species or subspecies, including author and year:

Seven African species of the genus *Afzelia* are currently recognised: *A. africana* Sm. ex Pers. (1805), *A. bella* Harms (1913), *A. bipindensis* Harms (1913), *A. pachyloba* Harms (1913), *A. parviflora* (Vahl) Hepper (1972), *A. peturei* De Wild. (1935) and *A. quanzensis* Welw. (1859). This proposal follows the nomenclature used by Donkpegan *et al.* (2020), which is proposed as the CITES standard reference for the African *Afzelia* species. Three varieties of *A. bella* are additionally recognised by some authors: *A. bella* Harms var. *bella*, *A. bella* var. *glabra* Aubrév., and *A. bella* var. *gracilior* Keay (Donkpegan *et al.*, 2014). The genus *Afzelia* also occurs in Southeast Asia, although for these species the taxonomy is more uncertain. Donkpegan *et al.* (2020) recognises the following four Southeast Asian species: *A. xylocarpa* (Kurz) Craib (1912), *A. rhomboidea* (Blanco) S. Vidal (1880), *A. javanica* (Miq.) J.Léonard (1950) and *A. palembanica* Baker (1878), and Royal Botanic Gardens Kew's Plants of the World Online database (POWO, 2021) additionally recognises *A. cambodensis* Hance (1876) and *A. martabanica*

* The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.

(Prain) J.Léonard (1950), but considers *A. palembanica* to be a synonym of *Intsia palembanica* Miq. (1861).

1.5 Scientific synonyms:

A. africana: *Afrazelia africana* (Sm. ex Pers.) Pierre (1899); *Afzelia speciosa* Coyte (1807); *Intsia africana* (Sm. ex Pers.) Kuntze (1891); *Pahudia africana* (Sm. ex Pers.) Prain (1902).

A. bella: *Afzelia microcarpa* A.Chev. (1909); *Pahudia bella* (Harms) de Wit (1941); *Pahudia microcarpa* (A.Chev.) de Wit (1941).

A. bipindensis: *Afzelia bequaertii* De Wild. (1925); *Afzelia caudata* Hoyle (1933); *Pahudia bipindensis* (Harms) de Wit (1941); *Pahudia caudata* (Hoyle) de Wit (1941).

A. pachyloba: *Afzelia brieyi* De Wild. (1914); *Afzelia zenkeri* Harms (1913); *Pahudia brieyi* (De Wild.) de Wit (1914); *Pahudia pachyloba* (Harms) de Wit (1941); *Pahudia zenkeri* (Harms) de Wit (1941).

A. parviflora: *Afrazelia bracteata* (Vogel ex Benth.) Pierre (1899); *Afzelia bracteata* Vogel ex Benth. (1848); *Intsia bracteata* (Vogel ex Benth.) Kuntze (1891); *Pahudia bracteata* (Vogel ex Benth.) Prain (1902); *Westia parviflora* Vahl (1810).

A. peturei: none

A. quanzensis: *Afrazelia attenuata* (Klotzsch) Pierre (1899); *Afzelia attenuata* Klotzsch (1861); *Afrazelia petersiana* (Klotzsch) Pierre (1899); *Afzelia petersiana* Klotzsch (1861); *Intsia attenuata* (Klotzsch) Kuntze (1891); *Intsia petersiana* (Klotzsch) Kuntze (1891); *Intsia quanzensis* (Welw.) Kuntze ex Engl. (1894); *Pahudia attenuata* (Klotzsch) Prain (1902); *Pahudia quanzensis* (Welw.) Prain (1902).

1.6 Common names: English: African mahogany, Afzelia, Pod mahogany, African oak
French: Doussié, Lingué

1.7 Code numbers:

2. Overview

Afzelia is a genus of large paleotropical trees, widely distributed in sub-Saharan Africa and Southeast Asia. Seven species occur in sub-Saharan Africa (*A. africana*, *A. bella*, *A. bipindensis*, *A. pachyloba*, *A. parviflora*, *A. peturei* and *A. quanzensis*). African *Afzelia* spp. are in decline due to intense overexploitation for the international timber trade. *A. africana*, *A. bipindensis* and *A. pachyloba* are categorised as globally Vulnerable in the IUCN Red List due to unsustainable harvest; *A. africana* has undergone a population decline of approximately 30% in three generations, and mature seed trees of *A. bipindensis* and *A. pachyloba* are now scarce. Based on local declines driven by unsustainable and illegal logging, the global population of *A. quanzensis* is suspected to be decreasing. Exports of *A. quanzensis* timber to Asia have seen a substantial increase in recent years, and the species is nationally threatened in several range States. Although *A. bipindensis* and *A. pachyloba* are reported to be the most commonly traded species, all seven African *Afzelia* spp. produce valuable timber that is considered of high quality in terms of durability, stability and aesthetics. The three major *Afzelia* spp. exporting range States are Cameroon, Ghana and Côte d'Ivoire. During 2008-2014, exports of African mahogany (a trade name including *Afzelia* spp. as well as other species) from Cameroon alone amounted to ~15 million kg, with >2.3 million kg exported to the European Union. The People's Republic of China and the United States of America are also key importers of African mahogany.

Afzelia spp. are locally important for subsistence harvest of traditional medicine ingredients, livestock fodder, wood for carving and construction, charcoal and fuelwood. The genus typically occurs at low densities, with slow growth and high seedling mortality. Harvest of bark and foliage is known to act synergistically with poor natural regeneration to impede population recovery, particularly after logging. *Afzelia* spp. are also impacted by deforestation in several range States, and *A. peturei*, which has a very small area of occupancy, was categorised as globally Vulnerable in 2019 based on habitat degradation and decline. On the basis of biological vulnerability to harvesting, ongoing trade and declines in populations in several range States, four African species (*A. africana*, *A. bipindensis*, *A. pachyloba* and *A. quanzensis*) are affected by trade according to the definition in Annex 5 ii) of Resolution Conf. 9.24 (Rev. CoP17) and fulfil the conditions in Criterion B of Annex 2a for inclusion in Appendix II. Since *Afzelia* spp. are not easily distinguishable from one another based on wood morphological characteristics and are known to be traded interchangeably,

inclusion of the remaining African species of the genus *Afzelia* (*A. bella*, *A. parviflora* and *A. peturei*) in Appendix II under Criterion A of Annex 2b of Resolution Conf. 9.24 (Rev. CoP17) is also proposed. The authors (as African range States and a major importer of African *Afzelia*) propose that regulation of trade in the African species of *Afzelia* is needed to ensure that harvest of specimens does not reduce their wild populations to a level at which their survival might be threatened.

Four *Afzelia* species occur in Southeast Asia (*A. xylocarpa*, *A. rhomboidea*, *A. javanica* and *A. palembanica*). The Asian populations of *Afzelia* are not included in this proposal on the basis that three of these four species (*A. xylocarpa*, *A. rhomboidei*, and *A. javanica*) are not significantly traded internationally (see Section 9). While *A. palembanica* (or more widely *Intsia palembanica*) is present in international trade, it is traded with other *Intsia* spp. under the common name “Merbau” and is thus differentiated in trade from African mahogany.

3. Species characteristics

3.1 Distribution

Seven species of the genus *Afzelia* occur naturally in sub-Saharan Africa (Donkpegan *et al.*, 2014). Botanic Gardens Conservation International’s “GlobalTreeSearch” database lists 36 African range States where *Afzelia* spp. are native (BGCI, 2021, unless otherwise specified), as outlined below:

A. africana is widespread in Africa, with an estimated extent of occurrence (EOO) of 4 850 397 km² (Hills, 2020). The species occurs in Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d’Ivoire, Democratic Republic of the Congo (hereafter, DRC), Ghana, Guinea, Guinea-Bissau, Mali, Niger, Nigeria, Senegal, Sierra Leone, the Republic of South Sudan, Sudan, Togo and Uganda.

A. bella is widespread, with a large EOO (>5 million km²) spanning Angola, Cameroon, Central African Republic, Congo, Côte d’Ivoire, DRC, Equatorial Guinea, Gabon, Ghana, Guinea, Liberia, Nigeria and Togo (Hills, 2019a).

A. bipindensis occurs in Angola, Cameroon, Central African Republic, Congo, DRC, Gabon, Nigeria and Uganda. The CITES Management Authority (MA) of Zambia (*in litt.* to European Commission, 2021) reports the species in Zambia.

A. pachyloba is native to Angola, Cameroon, Central African Republic, Congo, DRC, Gabon and Nigeria.

A. parviflora is found in Angola, Côte d’Ivoire, Guinea, Liberia and Sierra Leone, with an EOO of 296 562 km² and an area of occupancy (AOO) of 132 km² (BGCI and GTSG, 2019).

A. peturei is restricted to DRC and Zambia, with an estimated EOO of 378 492 km² and an estimated AOO of only 28 km² (Kamau *et al.*, 2021).

A. quanzensis is widespread, occurring in Angola, Botswana (from the extreme northeast to the periphery of the Okavango Delta in the northwest), Burundi, DRC, Eswatini, Kenya, Malawi, Mozambique, Namibia, Somalia, South Africa, Uganda, United Republic of Tanzania (hereafter, Tanzania), Zambia and Zimbabwe, and with a large estimated EOO of >6 million km² (Hills, 2019b).

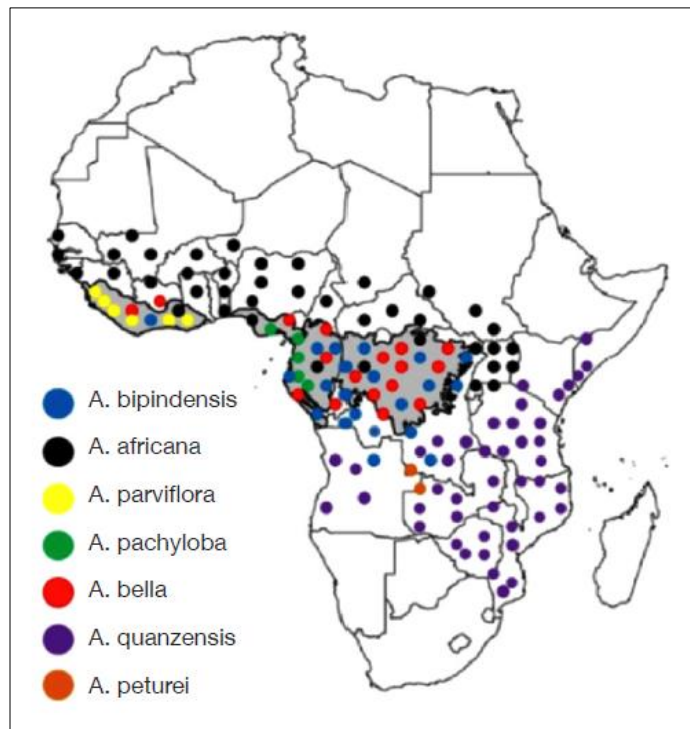


Figure 1. Native ranges of the seven African *Afzelia* spp. (map adapted by Donkpegan *et al.* (2014) using data from the Conservatory Botanical Gardens of Geneva, accessed 06/11/2012, and White, 1986). Source: Donkpegan *et al.* (2014), reproduced with permission. Note that occurrence points for some species are missing from known range States.

3.2 Habitat

A. africana occurs in savannahs, woodlands, gallery forests, mountainous vegetation and wooded grassland on deep sandy and alluvial soils (Akoègninou *et al.*, 2006; Sacande, 2007; Donkpegan *et al.*, 2014). In Benin, *A. afzelia* spreads from the Sudano-Guinean transition zone to the dry Sudanian climatic zone (Adomou *et al.*, 2005), and in Burkina Faso the species inhabits the Sudano-Sahelian and Sudanian climatic zones (Balima *et al.*, 2018). Similarly, *A. quanzensis* occupies savannah and woodland habitats (Donkpegan *et al.*, 2020). *A. bella*, *A. bipindensis*, *A. pachyloba* and *A. parviflora* inhabit rainforest and *A. peturei* is found in swampy gallery forest (Kamau *et al.*, 2021).

3.3 Biological characteristics

Afzelia spp. are typically slow growing deciduous trees (Oshingboye *et al.*, 2017). Although seedlings can exhibit rapid growth – for example, *A. quanzensis* seedlings can gain 50-60 cm in height per year – growth slows substantially at around seven years of age, with bole growth in young trees ranging from 0.3-0.5 mm per year (Gérard and Louppe, 2011a). Annual stem diameter growth reported for young trees ranged from 0.06 cm in *A. quanzensis* (Gerhardt and Todd, 2009) to 1 cm in *A. africana* (Gérard and Louppe, 2011b). *Afzelia* spp. were considered to reach reproductive maturity at sizes of ≥ 20 cm Diameter at Breast Height (DBH) (Doucet, *pers. comm.* in Donkpegan *et al.*, 2014). *Afzelia* spp. are light demanding, showing a typical regeneration deficit (Beeckman, *in litt.* to UNEP-WCMC, 2020). However, in juvenile stages (sapling and seedling), *A. africana* was reported to tolerate shade and to grow under closed canopy (Biaou *et al.*, 2011). *A. africana* is hermaphroditic and was reported to flower from March to April, with fruits maturing in December or January (Ahouangonou and Bris, 1997). Sacande (2007) noted that *Afzelia* spp. seeds vary in size, with smaller seeds tending to germinate more rapidly, and seedlings from larger seeds having higher growth rates. *A. africana* produces very fragrant white and purple flowers (Arbonnier, 2002; Amahowe *et al.*, 2017) and large seed pods containing 6-12 black seeds with yellow/orange arils (Bonou *et al.*, 2009; Egwujeh and Yusufu, 2015).

3.4 Morphological characteristics

Afzelia spp. are generally large trees, reaching heights of 18-35 m (Oshingboye *et al.*, 2017). Average height growth differs between species (Gérard and Louppe, 2010a; 2011b) and habitat types, with *A. africana* known to reach a height of 18 m in savannah and 35 m in forest (Arbonnier, 2002; Amahowe

et al., 2017). Donkpegan *et al.* (2014) noted that distinguishing between *Afzelia* spp. based on morphology was “difficult in the field”, making forest inventories of growing stock challenging.

3.5 Role of the species in its ecosystem

Afzelia spp. are nitrogen fixing legumes (Kitin *et al.*, 2021) and as such are reported to improve soil fertility (Cunningham, 2016; CITES MA of Sudan *in litt.* to European Commission, 2021; Kitin *et al.*, 2021) and play an important role in agro-forestry (Hills, 2020). The trees support growth of nitrogen-fixing ectomycorrhizal fungi, which are harvested for food by local people in some areas (Cunningham, 2016). *A. africana* trees are reported to reduce erosion and be somewhat fire-resistant (CITES MA of Sudan *in litt.* to European Commission, 2021); however, fire was reported to impede natural regeneration of *A. quanzensis* (CITES MA of Malawi *in litt.* to European Commission, 2021). *A. quanzensis* seeds are an important food source for various species of birds, monkeys and squirrels (Cunningham, 2016), and in Botswana the leaves are grazed by eland and grey duiker and the leaves and bark by elephants (CITES MA of Botswana *in litt.* to European Commission, 2021).

4. Status and trends

4.1 Habitat trends

Numerous *Afzelia* spp. range States across Africa are experiencing significant deforestation (FAO, 2020; Vancutsem *et al.*, 2021; see Section 4.5), and *A. peturei* is noted to be threatened by habitat loss driven by encroaching urban development and agricultural land (Kamau *et al.*, 2021).

4.2 Population size

No estimates of population size could be found for African populations of *Afzelia* spp. However, the average population density of *A. africana* in study sites across Benin ranged from 142 trees/ha in a protected forest reserve to <2 trees/ha in exploited areas; the species' population in West Africa was reported to be under permanent harvest pressure, leading to low population density and reduced regeneration (Glele Kakai, 2010). *A. bella* is reported to be “locally common” across its range (Hills, 2019a). *A. bipindensis* is reported to be scattered at low densities, especially in Gabon and Cameroon, where the average density of trees with an average diameter of 60 cm was reported to be about 0.2 tree/ha (Gérard and Louppe, 2010a), although the species was considered fairly common in the central basin of DRC (Kiyulu *et al.*, 2014). In Botswana, *A. quanzensis* occurs in “small-fragmented clusters” or as remnant trees rather than in large populations (CITES MA of Botswana *in litt.* to European Commission, 2021). Preliminary results from Angola's 2015 national forest inventory estimated a standing timber volume of 0.005 m³/ha for *A. quanzensis* (trees in the 20-50 cm DBH size class), a relative frequency of 0.36%, a relative density of 0.04%, a relative dominance of 0.04%, and a basal area of 0.13 m²/ha (CITES MA of Angola *in litt.* to European Commission, 2022). *A. pachyloba* is typically scattered at low densities, and an average wood volume of 1 m³/ha was reported for trees of >60 cm DBH in western Cameroon, with “even lower” densities in Gabon (Kiyulu *et al.*, 2014).

4.3 Population structure

Information on population structure of *Afzelia* spp. was scarce; however, in northern Benin, Chabi *et al.* (2013) reported an absence of *A. africana* trees in small (10-20 cm) and large (50-60 cm) diameter size classes, and noted that all other size classes occurred at low densities (fewer than 3 stems/ha). The absence of small trees would appear to indicate low recruitment in addition to the population decline indicated by the low densities in all size classes. Assogbadjo *et al.* (2010) indicated that small diameter specimens of *A. africana* could be found in the Sudanian zone, while large diameter individuals could only be located in the Guineo-Congolese and Sudano-Guinean zones. Some Botswanan populations of *A. quanzensis* were noted to show no young regeneration (CITES MA of Botswana *in litt.* to European Commission, 2021). In northern South Africa, adult *A. quanzensis* trees were found to be scattered or in clumps; recruitment was low, with few individuals of <10 cm DBH found (Gerhardt and Todd, 2009).

4.4 Population trends

A. africana, *A. bipindensis* and *A. pachyloba* are categorised as globally Vulnerable in the IUCN Red List due to overexploitation for timber (Hills, 2020; African Regional Workshop, 1998a, 1998b). *A. quanzensis*, *A. bella* and *A. parviflora* were categorised as Least Concern in the IUCN Red List

in 2019 on the basis of a wide distribution; however, information on population size for these species was lacking, and *A. quanzensis* was considered locally threatened in some areas due to selective logging (BGCI and GTSG, 2019; Hills, 2019a, 2019b). *A. peturei* is categorised as Vulnerable and in decline due to ongoing habitat loss (Kamau *et al.*, 2021). The IUCN Red List assessments for *A. bipindensis* and *A. pachyloba* are both annotated as in need of updating (African Regional Workshop, 1998a, 1998b); however, both are planned to be re-assessed in 2022 (Hills *in litt.* to UNEP-WCMC, 2021a).

A. africana populations were suspected to have undergone a decline of 30% over three generations (150 years) as a result of intensive and unsustainable harvesting, and the species showed a decreasing population trend as of 2020 due to ongoing harvest pressure (Hills, 2020). *A. africana* is considered endangered in Benin (Sinsin *et al.*, 2004; Bonou *et al.*, 2009) due to unsustainable harvest and an absence of regeneration practises resulting in the decline of natural populations (Gérard and Louppe, 2011b). Balima *et al.* (2018) reported that in Burkina Faso, *A. africana* is considered nationally threatened due to overharvest and is abundant only in protected areas and in sacred groves. The absence of practises such as seeding, assisted natural regeneration, or sapling transplantation were acknowledged to be negatively impacting the species in rural parts of the country (Balima *et al.* 2018). Harvest of *A. africana* bark and foliage for medicinal use and livestock fodder in Burkina Faso was found to reduce fruit production by 50-95% in small trees (Nacoulma *et al.*, 2017). *A. africana* was categorised as nationally vulnerable in Cameroon in 2011, due to exploitation for the international timber trade as well as deforestation for agriculture (Onana and Cheek, 2011). In the Sudan, *A. africana* was considered “endangered” as a result of intensive and increasing exploitation for timber and fuelwood, encroachment of agricultural and urban areas, overgrazing, and the species’ intrinsic poor natural regeneration (CITES MA of Sudan *in litt.* to European Commission, 2021). Ugandan media reported that *A. africana* has been depleted from several forests in the north of the country, and that trees had been felled for timber at such an alarming rate in some forests that only stumps remained (Sunday Vision, 2018). *A. africana* is reported to be under “immense logging pressure” in the Republic of South Sudan, with large trees selectively targeted for harvest; the rate of felling is reported to exceed the species’ rate of natural regeneration “by several orders of magnitude”, and there is a risk of local extirpation (the Republic of South Sudan Ministry of Wildlife and Tourism, *in litt.* to European Commission, 2021).

A. bipindensis: Unsustainable harvest for timber was reported to have reduced the mature population of *A. bipindensis* to the point that “few seed trees” remained in some parts of the species’ range (African Regional Workshop, 1998a). *A. bipindensis* was categorised as nationally vulnerable in Cameroon in 2011, due to heavy exploitation for the international timber trade (Onana and Cheek, 2011). The species was listed as nationally endangered in DRC in 2014, as a result of unsustainable logging, deforestation caused by urbanisation and agriculture, and tree bark damage by forest elephants (Kiyulu *et al.*, 2014). Overexploitation of the species in DRC has led to a “continued and accelerated decline” considered “irreversible” due to illegal logging, poor forest governance, and slash and burn agriculture negatively impacting regeneration (Kiyulu *et al.*, 2014). The authors noted an increase in harvestable volume permitted by DRC forestry administration of 8 m³ to 1836 m³ over five years [assumed to be 2009-2014], with no accompanying conservation measures for the species (Kiyulu *et al.*, 2014). In Angola, *Azelia* spp. including *A. bipindensis* are considered “still in relative ecological balance, considering the volumes licensed annually [for harvest]” (CITES MA of Angola *in litt.* to European Commission, 2022).

A. pachyloba: Unsustainable harvest for timber was also reported to have reduced the mature population *A. pachyloba* to the point that there were “few seed trees” remaining throughout the species’ range (African Regional Workshop, 1998b). *A. pachyloba* was categorised as nationally vulnerable in Cameroon in 2011, due to heavy exploitation for the international timber trade (Onana and Cheek, 2011). In DRC, the species is restricted to the extreme southwest region where harvest pressure for timber, subsistence uses and cabinet making is considered to be contributing to its local disappearance; however, the species was categorised as nationally least concern in 2014 (Kiyulu *et al.*, 2014). In Angola, *Azelia* spp. including *A. pachyloba* are considered “still in relative ecological balance, considering the volumes licensed annually [for harvest]” (CITES MA of Angola *in litt.* to European Commission, 2022).

A. quanzensis: Although widespread, the global population of *A. quanzensis* was suspected to be decreasing due to local declines from unsustainable and illegal logging (Gérard and Louppe, 2011a). Although the CITES MA of Angola (*in litt.* to European Commission, 2022) note that *Azelia* spp. in Angola are considered to be “still in relative ecological balance”, *A. quanzensis* has also been reported to be locally threatened in Angola, Mozambique and Somalia by timber logging and local consumption, and the species is listed in the national red lists of Malawi and Mozambique as vulnerable and near

threatened respectively (Hills, 2019b). The species' population in Malawi has declined over the past 30 years, from being once "conspicuous along riverbanks" to a level where trees can "hardly be found" (CITES MA of Malawi *in litt.* to European Commission, 2021). The country's *A. quanzensis* population is considered to be threatened at present due to high demand for its timber and timber products (CITES MA of Malawi *in litt.* to European Commission, 2021). A 2012 assessment of Burundi's forest genetic resources determined that the species was nationally threatened (CITES MA of Burundi *in litt.* to European Commission, 2021a), and mature trees are reported to be rare in Zambia (Republic of Zambia, 2015). In eastern Tanzania, *A. quanzensis* is considered at risk of becoming commercially extinct due to harvest pressure, with traders in some regions reportedly resorting to harvesting diseased and irregular shaped specimens for production of short planks (Milledge and Kaale, 2005). However, a study published in 2009 [exact fieldwork date unknown] noted that illegal logging of remaining *A. quanzensis* trees of >20 cm DBH was still evident in Tanzania's north-eastern coastal woodlands (Mligo *et al.*, 2009). In Botswana, the species is "under excessive pressure" due to high demand for its wood, as well as subsistence harvest of leaves, bark and roots, forest fires and destructive foraging by elephants (CITES MA of Botswana *in litt.* to European Commission, 2021). In South Africa, natural recruitment of *A. quanzensis* was found to be low, with seedlings impacted by browsing and drought; over a five-year period; annual seedling mortality was >65% (Gerhardt and Todd, 2009). The authors suggested that the transition from sapling to small tree constitutes a regeneration "bottleneck" in *A. quanzensis* (Gerhardt and Todd, 2009). In Malawi, the species was reported to be slow growing at "most sites" (CITES MA of Malawi *in litt.* to European Commission, 2021).

***A. bella*, *A. parviflora*, *A. peturei*:** The population trend of *A. bella* is unknown but assumed stable as the species is widespread and locally common (Hills, 2019a). Similarly, the population trend of *A. parviflora* was considered stable (BGCI and GTSG, 2019). *A. peturei* was noted to be in decline due to habitat loss impacting its very small AOO (Kamau *et al.*, 2021). In Liberia, natural regeneration of *A. bella* and *A. parviflora* is impacted by destruction of naturally-regenerated seedlings "during the [timber] felling and skidding cycles"; this loss of seedlings also contributes to the species' genetic erosion in the country (CITES MA of Liberia *in litt.* to European Commission, 2021).

4.5 Geographic trends

Several African range States of *Azelia* spp. have experienced significant deforestation in recent years (FAO, 2020; Vancutsem *et al.*, 2021). *A. peturei* is threatened by habitat loss throughout its range in DRC and Zambia (Kamau *et al.*, 2021). Alamu and Agbeja (2011) identified *Azelia* spp. as "indigenous, endangered species experiencing deforestation" in Nigeria. In Kenya, the coastal range of *A. quanzensis* was reported to have suffered "major habitat loss" due to clearance for agriculture (Cunningham, 2016). According to the Global Forest Resources Assessment (FRA) for 2020, the ten countries with the highest average annual net loss of forest area 2010-2020 included Angola (annual net forest change of -0.8%), DRC (-0.83%), Mozambique (-0.56%) and Tanzania (-0.88%) (FAO, 2020). In 2018 approximately 4% of total global wood removals (that is, removal of roundwood and fuelwood from forests, other wooded land and areas of trees outside forests) were split equally between DRC and Nigeria (FAO, 2020). Additionally, a long-term assessment of reduction in undisturbed tropical moist forest (that is, forest unaffected by deforestation or degradation) noted that the African countries with the greatest reduction 1990-2019 included Côte d'Ivoire (a reduction of 81.5%), Ghana (-70.8%), Angola (-67%), Nigeria (46.7%) and Liberia (36%) (Vancutsem *et al.*, 2021). Cameroon (-12.7%) and Gabon (-2.9%) had comparatively lower levels of reduction; however, the study found that these two countries, alongside DRC, contain the largest areas of forest converted into tree plantations within Africa, at 0.07 million ha, 0.04 million ha, and 0.08 million ha respectively (Vancutsem *et al.*, 2021).

5. Threats

Azelia spp. are intensively logged and threatened by overexploitation for the international timber trade (Oshingboye *et al.*, 2017; Donkpegan *et al.*, 2014, 2020), leading to population declines and scarcity of mature seed trees (African Regional Workshop, 1998a, 1998b; Hills, 2019b; Hills, 2020). Local subsistence harvest for fuelwood, charcoal, livestock fodder and traditional medicine ingredients put additional pressure on *Azelia* spp. (Assogbadjo *et al.*, 2010; Kiyulu *et al.*, 2014; Oshingboye *et al.*, 2017), and pruning foliage for fodder was explicitly linked to declines in tree fitness, fruiting and dispersal capacity (Amahowe *et al.*, 2017; Nacoulma *et al.*, 2017). Bark damage by elephants and seed predation by rodents were also noted to impact some *Azelia* spp. (CITES MA of Botswana *in litt.* to European Commission, 2021). The genus typically occurs at low densities (Gérard and Louppe, 2010a; Kiyulu *et al.*, 2014), is slow-growing and exhibits poor natural regeneration (Gérard and Louppe, 2011a). Seedlings are susceptible to fire, browsing and drought (Gérard and Louppe, 2011a). Additionally, numerous *Azelia* spp. range States are undergoing significant deforestation (Vancutsem *et al.*, 2021) and *A. peturei* is globally threatened due to habitat loss

(Kamau *et al.*, 2021). These stressors act synergistically, leading to ongoing population declines and reduced species regeneration (Glele Kakaï, 2010). For example, *A. africana* natural populations in West Africa were affected by permanent harvest pressure for both timber and non-timber products, leading to reduced species regeneration and habitat loss (Glele Kakaï, 2010); environmental and climate stress, particularly in arid or semi-arid Sudanian climatic zones, was also found to reduce seedling establishment of the species in Benin (Amahowe *et al.*, 2017). See Section 4.4 for more detail on individual *Afzelia* spp. declines.

6. Utilization and trade

6.1 National utilization

As a result of the durability, suitability for use in humid conditions, resistance to insects and several chemicals, and attractive appearance of their timber (Gérard and Louppe, 2010a), *Afzelia* spp. are sought after for use in construction and boatbuilding (Assogbadjo, *et al.*, 2010; Beeckman, *in litt* to UNEP-WCMC, 2020), as well as decorative veneer, furniture, joinery, frames and utensils (Gérard and Louppe, 2010a). *Afzelia* spp. are also used for firewood and charcoal production (Oshingboye *et al.*, 2017).

A. africana: The wood is used locally for various craft items such as kitchen utensils, weapons, canoes and musical instruments in Burkina Faso (Balima *et al.*, 2018) and for firewood, carpentry, and for flooring, doors and stairs in the Sudan (CITES MA of Sudan *in litt.* to European Commission, 2021). The species was also recognised as an important fodder species in West Africa (Ouédraogo-Koné *et al.*, 2006). In Nigeria, flour obtained from the seeds is used as a thickening agent of soup (Egwujeh and Yusufu, 2015) and in the Sudan, the leaves, flowers and seeds are used as vegetables, spices and a source of protein, respectively (CITES MA of Sudan *in litt.* to European Commission, 2021). Oil extracted from *A. africana* seeds has industrial properties (Nwajinka *et al.*, 2017), and the seed pod is used to make soap (Egwujeh and Yusufu, 2015).

A. quanzensis: Reported to be highly targeted and harvested for sawn wood production in Tanzania (Milledge *et al.*, 2007). The wood is also used for high quality furniture and for fishing boats in coastal east Africa (Cunningham, 2016) and Botswana (CITES MA of Botswana *in litt.* to European Commission, 2021), and for curios, decorative veneer, panelling, building work, firewood and charcoal production in Malawi (CITES MA of Malawi *in litt.* to European Commission, 2021). In addition, other parts of the species are used as a food source (leaves), for medicine (roots) (Hills, 2019b), and for decorative purposes such as necklaces (seeds) (Jøker and Msanga, 2000 in Hills, 2019b; CITES MA of Botswana *in litt.* to European Commission, 2021). In Malawi, the bark of *A. quanzensis* is used for rope (CITES MA of Malawi *in litt.* to European Commission, 2021). In Botswana, the leaves, bark and roots are harvested for traditional medicine. *A. quanzensis* is also planted as a shade/ornamental tree in urban areas of Botswana (CITES MA of Botswana *in litt.* to European Commission, 2021), as well as in parts of Malawi (CITES MA of Malawi *in litt.* to European Commission, 2021). The species is one of the main timbers harvested and traded in Angola and, recently, Namibia (Nott *et al.*, 2020), and was described as a “primary timber species” of Botswana (CITES MA of Botswana *in litt.* to European Commission, 2021).

A. bipindensis* and *A. pachyloba: Commonly traded as “apa” or “doussié rouge” / “red doussié, the species is reported to be extensively used for construction purposes in Nigeria (Jimoh *et al.*, 2016). *A. bipindensis* and *A. pachyloba* were reported to be among the most frequently harvested timber species in DRC (Hills *in litt.* to UNEP-WCMC, 2021b). *A. pachyloba* wood is harvested in DRC for use in cabinet making (Kiyulu *et al.*, 2014).

6.2 Legal trade

Afzelia spp. produce high-quality timber with properties comparable to *Tectona grandis* (Teak) and *Tieghemella* spp. (Kitin *et al.*, 2021). *Afzelia* spp. timber is termite resistant, has a neutral pH, and is durable for use in permanent humid conditions without shrinkage or warping, making it highly sought after on the international market for various construction and industrial uses including boat building and precision machinery (Gérard and Louppe, 2010a; Kitin *et al.*, 2021). *Afzelia* wood is also prized for its aesthetics, and the species are also traded for use in furniture, flooring, veneer and musical instruments (Gérard and Louppe, 2010a; Kitin *et al.*, 2021). As a result of this stability, durability and decorative appearance, *Afzelia* timber have high economic value and are considered “of the few very best timbers in the world” (Beeckman, *in litt* to UNEP-WCMC, 2020).

Timber of *A. africana*, *A. bella*, *A. bipindensis*, *A. pachyloba* and *A. quanzensis* is frequently traded under the genus name or under the common trade name “doussié” (Gérard *et al.*, 2017). *A. bipindensis* and *A. pachyloba* have been reported as the most commonly traded African *Azelia* spp., and Cameroon was noted as the main African exporter of the genus (Hills *in litt.* to UNEP-WCMC, 2021b), with Côte d’Ivoire and Ghana also named as major exporters (Kitin *et al.*, 2021).

According to figures recorded by value in USD from the International Trade Centre’s “Trade Map” tool¹, over the period 2010-2019, the United States of America imported African mahogany products (under Harmonised System (HS) code 4407290106²) equivalent to a total value of USD 214 359, of which USD 210 256 was imported from *Azelia* spp. range States (see Table 1), USD 2654 was imported from the European Union (hereafter EU), and USD 1449 was imported from other countries (Trade Map, 2021). It should be noted that the trade name “African mahogany” is also used to refer to other taxa, including *Khaya* spp. (Oni and Igboanugo, 2007); therefore, it cannot be assumed that all of the trade summarised in Tables 1 and 2 was in *Azelia* spp.

Table 1. Imports of African mahogany (HS code 4407290106) by value in USD from *Azelia* spp. range States to the United States of America over the period 2010-2019. Source: Trade Map, 2021.

Exporter	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Ghana	9395	7221	9034	9031	8954	8966	4915	5767	8081	6067	77 431
Cameroon	4141	7570	8165	7695	6775	10 584	6569	6286	4155	5267	67 207
Côte d’Ivoire	5476	5596	4759	5602	3202	3128	926	750	490	139	30 068
Congo	1746	1853	2650	3365	2675	3813	2505	2128	1153	1901	23 789
DRC	404	294	212	293	740	604	1492	1583	303	26	5951
Gabon	31	163	471	1255	1327	854	364	124	164	344	5097
Guinea	230	28	16		155	77					506
Central African Republic	24		33			3		68			128
South Africa		19		3						29	51
Equatorial Guinea		28									28

According to figures recorded by weight in kg from the International Trade Centre’s Trade Map tool, over the period 2008-2014 Cameroon exported African mahogany to other *Azelia* range States, the EU and other countries (Trade Map, 2021). The products were traded under two HS codes: 44072902000³ and 44083902000⁴, comprising totals of 15 138 730 kg and 69 793 kg respectively (see Table 2) (Trade Map, 2021).

Table 2 Exports of African mahogany (HS codes 44072902000 and 44083902000) by weight in kg from Cameroon over the period 2008-2014. No exports were reported for the years 2009 or 2013. Source: Trade Map, 2021.

HS code	Importer	2008	2010	2011	2012	2014	Total
44072902000	Range States		229 049	108 247	57 530	39 851	434 677
	European Union		756 400	280 741	687 128	651 003	2 375 272
	Rest of World		1 503 651	2 643 849	1 901 662	6 279 619	12 328 781
44083902000	Range States	4899					4899
	European Union				31 457		31 457
	Rest of World			2563	30 874		33 437

***A. africana*:** Cameroon exported 9000 m³ of *A. africana* sawn wood in 2003 and 47 759 m³ in 2005, and Ghana exported 9000 m³ in 2005 and 7000 m³ in 2006 (Gérard and Louppe, 2011b). Sawn wood exports were also reported from Côte d’Ivoire pre-2008; timber supply from Côte d’Ivoire fell after 2008, due to the gradual decrease in number of stems (Gérard and Louppe, 2011b). In 2017, Benin imported 3138 m³ of timber of *A. africana* and *Pterocarpus erinaceus* from Nigeria (The World Bank, 2020). Ugandan media reported in 2018 that between 100 and 150 containers (each carrying ~40 000 kg of

¹ Trade Map is available at: <https://www.trademap.org/Index.aspx>

² Harmonised System (HS) code 4407290106: Acajou d’Afrique aka African Mahogany, sawn or chipped lengthwise, sliced or peeled, of a thickness exceeding 6 mm.

³ HS code 44072902000 (Cameroon): African mahogany or Ngollon or Ndola or Deke timber, sawn.

⁴ HS code 44083902000: African mahogany wood in sheets of veneer, of plywood, not exceeding 6 mm in thickness.

logs) were “cleared” every month for export from northern Uganda to the People’s Republic of China (hereafter China) (Sunday Vision, 2018).

Although the species’ market value appears to vary by range State, in general, prices appear to be slightly increasing over time. The price of sawn wood from Cameroon and Ghana averaged USD 780 per m³ over the period 2003-2006 (Gérard and Louppe, 2011b), but reached USD 891 m³ from DRC in 2012 (ITTO, 2015) and USD 922 from Ghana in 2017. In 2017, the average price per m³ for *A. africana* sawn wood exported from Ghana was USD 506 more than wood exported from Liberia (ITTO, 2019). Reportedly, in 2018, for every *A. africana* tree harvested in Uganda, landowners earned USD 2.5-15 although the logs were worth USD 50 000 when they reached China (Sunday Vision, 2018).

A. bipindensis: The species is a high value timber tree (Gérard and Louppe, 2010a). *A. bipindensis* timber is reported to be often mixed with that of other species such as *A. pachyloba* (or doussié blanc /white doussie) and exported from Cameroon (Gérard and Louppe, 2010a). *A. bipindensis* and *A. pachyloba* were identified as two of the six species that make up approximately 60% of all harvested timber in Cameroon (Caspa *et al.*, 2007). It was noted that these six key timber species may have been locally depleted in areas near to Cameroon’s ports of export, causing logging companies to move further east and south to find commercial stands (Caspa *et al.*, 2007). In DRC, *A. bipindensis* is reportedly exploited as a category 1 timber, exported on the international market for use in pleasure boat construction (Kiyulu *et al.*, 2014). The CITES MA of Angola (*in litt.* to European Commission, 2022) reported that forest licensing volumes for *Afzelia* spp. are established annually; licensed harvest volumes for *A. bipindensis* were 200 m³ in 2019, 200 m³ in 2020, and 1050 m³ in 2021.

A. pachyloba: Cunningham (2016) reported that *A. pachyloba* timber is exported from Central Africa. Logs have been reported to be exported from Cameroon (17 000 m³ in 2008), Congo (1500 m³ yearly 2004-2007), Gabon (1350 m³ yearly 1991-1999) and Central African Republic (6500 m³ in 2004) (Gérard and Louppe, 2011c). In Angola, licensed harvest volumes for *A. pachyloba* were 900 m³ in 2019, 585 m³ in 2020, and 1140 m³ in 2021 (CITES MA of Angola *in litt.* to European Commission, 2022).

A. quanzensis: The species is traded for timber and is used in plywood manufacture and for construction and panelling (Nott *et al.*, 2020). *A. quanzensis* was identified as one of the main timber species traded regionally throughout east and southern Africa (Lukumbuzya and Sianga, 2017). Cunningham (2016) reported unsustainable logging and extensive international trade in *A. quanzensis* from Kenya, Mozambique and Tanzania. Natural forest timber of *A. quanzensis* is imported into Tanzania from DRC, Mozambique, Uganda and Zambia (Lukumbuzya and Sianga, 2017). *A. quanzensis* was reported to be one of the most commonly exported timber species from Mozambique, with imports destined for China (Egas *et al.*, 2018), as well as Europe and South Africa for parquet flooring, windows and furniture (Anon., 2014; Lukumbuzya and Sianga, 2017). More than half of the commercial timber volume harvested in Mozambique was reported to be from three species, including *A. quanzensis* (FAEF, 2013 in Cunningham, 2016). A “massive increase” was reported in *A. quanzensis* timber exports to Asia, mainly from Mozambique to China, for use in flooring and doors and it has been suggested that, due to the brown-red colour of its timber, the species may be used as an “unofficial” hongmu rosewood in China (Cunningham, 2016). In southwest Africa, Namibia has relatively recently started to export the species (Nott *et al.*, 2020). *A. quanzensis* is reported to be one of the main timber species exported from Angola, and the national CITES MA (*in litt.* to European Commission, 2022) reported that 4425 m³ of *A. quanzensis* timber was licensed for harvest in 2021; the species was not licensed for harvest in Angola in 2019 or 2020 (receiving a quota of “0.00 m³” in both years).

A. bella: Cunningham (2016) reported that other African species of *Afzelia* are exported as timber including *A. bella* from West Africa. Cameroon was also reported to have exported 9900 m³ of *A. bella* sawn wood in 2003 and 47 750 m³ in 2005 (Gérard and Louppe, 2010b).

6.3 Parts and derivatives in trade

Afzelia timber species are logged for their high value timber (Oshingboye *et al.*, 2017). Parts such as leaves, roots, pods, seeds, aril and fruits are harvested by local people as ingredients in traditional medicine, soaps and cooking (Kiyulu *et al.*, 2014; Oshingboye *et al.*, 2017; Balima *et al.*, 2018). *Afzelia* spp. leaves and branches constitute important livestock fodder in several range States (Petit and Mallet, 2001; Assogbadjo *et al.*, 2010; Kiyulu *et al.*, 2014; CITES MA of Sudan *in litt.* to European Commission, 2021), particularly during the dry season (Assogbadjo *et al.*, 2010).

6.4 Illegal trade

Despite national measures in place, Cunningham (2016) noted illegal harvest of *A. quanzensis* in Mozambique, including logging without permits and logging in prohibited areas. Illegal harvest of *A. africana* from private land and protected areas in Uganda for export to Asia was described as “rampant” over the period 2018-2019 (Hills, 2020). According to a Ugandan news article, traders were reported to have illegally harvested *A. africana* trees in Uganda, claiming that they were sourced from the Republic of South Sudan or DRC for export to Asian countries to circumvent a national ban on exports of raw timber (Sunday Vision, 2018). The CITES MA of Belgium (*in litt.* to UNEP-WCMC, 2021) reported that the Laboratoire de biologie du bois de Yangambi (Yangambi Wood Laboratory), DRC, identified recent instances of *Afzelia* spp. timber being exported from DRC to Uganda via the border town of Kasindi under fraudulent documentation that misidentifies the timber as *Mammea africana*, a low-value timber that is rarely logged. Analysis of two wood blocks documented as being *M. africana* revealed the wood of one to be *A. bipindensis* and the other either *A. bipindensis* or *A. quanzensis* (Laboratoire de biologie du bois de Yangambi, 2020). The CITES MA of Belgium (*in litt.* to UNEP-WCMC, 2021) cautioned that such fraudulent exports are anticipated to become more frequent if African *Afzelia* spp. are listed in CITES Appendix II, but noted that listing would also aid monitoring and increase international scrutiny of the illegal trade.

6.5 Actual or potential trade impacts

African *Afzelia* spp. are prized both nationally and internationally for their high-quality timber (Oshingboye *et al.*, 2017), which is highly durable, stable in humidity, resistant to insect attack, and aesthetically decorative (Kitin *et al.*, 2021). As a result, *Afzelia* timber has high market value and African populations continue to be intensively logged to meet high international demand (Beeckman, *in litt.* to UNEP-WCMC, 2020). The wood of all seven species is morphologically indistinguishable (Thünen Institute of Forest Genetics, 2015, see Section 11), meaning that *Afzelia* spp. are often traded interchangeably (Gérard *et al.*, 2017). Although *A. bipindensis* and *A. pachyloba* have been reported as the most commonly traded species (Hills *in litt.* to UNEP-WCMC, 2021b), *A. africana* and *A. quanzensis* are similarly intensively logged and all four species have undergone population declines as a result of unsustainable harvest (African Regional Workshop, 1998a, 1998b; Hills, 2019b; Hills, 2020). Logging has driven a population decline of approximately 30% over three generations in *A. africana* (Hills, 2020), and mature seed trees are now scarce within the entire range of *A. pachyloba* and across parts of the range of *A. bipindensis* (African Regional Workshop, 1998a, 1998b). Based on such declines, *A. africana*, *A. bipindensis* and *A. pachyloba* are all categorised as globally Vulnerable in the IUCN Red List (Hills, 2020; African Regional Workshop, 1998a, 1998b). While not listed as globally threatened, *A. quanzensis* is nationally threatened by unsustainable, and in some cases illegal, logging pressure in several range States (Republic of Zambia, 2015; Cunningham, 2016; Hills, 2019b) and is considered at risk of commercial extinction in eastern Tanzania (Milledge and Kaale, 2005). In recent years, there has reportedly been a significant increase in *A. quanzensis* exports to Asia (Cunningham, 2016).

The impacts of timber harvest are compounded by additional stressors; *Afzelia* spp. are also subject to habitat loss in some areas (Kamau *et al.*, 2021), as well as local harvest for woodcarving, fuelwood, traditional medicine and livestock fodder in many range States (Assogbadjo *et al.*, 2010; Kiyulu *et al.*, 2014; Oshingboye *et al.*, 2017). Such harvest, particularly of bark and foliage, is known to impact fruiting and regeneration of trees (Nacoulma *et al.*, 2017). Cumulative pressure of logging, non-timber product harvest and habitat loss has led to population declines and reduced regeneration in West African populations of *A. africana* (Glele Kakai, 2010). *A. africana*, *A. bipindensis*, *A. pachyloba* and *A. quanzensis* occur at low densities (Gérard and Louppe, 2010a; Kiyulu *et al.*, 2014), and intrinsic recruitment of *Afzelia* spp. in the wild is generally poor (Gerhardt and Todd, 2009). Seedling mortality is further increased by livestock browsing, drought and fire (Gerhardt and Todd, 2009). In DRC, slash and burn agriculture is considered to be negatively impacting *A. bipindensis* regeneration to the point where population declines from logging are now “irreversible” (Kiyulu *et al.*, 2014). The systematic harvest of large *Afzelia* trees was projected to eventually result in a substantial decline of more than 50% of a natural population (Beeckman, *in litt.* to UNEP-WCMC, 2020).

7. Legal instruments

7.1 National

Legislative measures to protect national populations of *Afzelia* spp. are in place in a number of range States – these are outlined in Annex 2. No relevant national legal instruments could be located for

DRC, Equatorial Guinea, Eswatini, Ghana, Kenya, Liberia, Namibia, Niger, Somalia, South Africa, the Sudan or Zimbabwe.

7.2 International

Cameroon, Central African Republic, Congo, Côte d'Ivoire, DRC, Gabon, Ghana and Liberia have signed legally binding FLEGT Voluntary Partnership Agreements (VPA) with the EU to ensure that timber and timber products exported to the EU are legally-sourced (European Forest Institute, 2020). In the case of Cameroon, the FLEGT VPA agreement does not include ***A. bipindensis*** and ***A. pachyloba*** logs, but could include processed *Afzelia* spp. (The European Union and The Republic of Cameroon, 2011).

8. Species management

8.1 Management measures

No information on genus or species-specific management plans was found for *Afzelia* spp. However, minimum exploitable diameters (MEDs) have been established in a number of range States for some species, as outlined below:

A. africana trees are considered sacred by some ethnic groups in Burkina Faso, and, as such, harvest for firewood is locally prohibited (Balima *et al.*, 2018). However, management practices such as seeding and assisted natural regeneration were absent within Burkina Faso farmlands (Balima *et al.*, 2018). In Sierra Leone, it is a high-volume commercial species and, under the Forestry Regulation of 1989, is subject to non-species-specific MEDs of 183 cm in selective felling areas and 122 cm in clear-felling areas (Government of Sierra Leone, 1990).

A. bipindensis is classed as a wood-producing species with a MED of 80 cm in Angola, under Presidential Decree No. 171/18 of 23rd July 2018, which approves the Forestry Regulation (Órgão Official da República de Angola, 2018). A similar MED, of 70 cm, is in operation for the species in Gabon, under Order No. 000117/PR/MEFEPEPN of 1st March 2004 (Republique gabonaise, 2004).

A. pachyloba is subject to the same 80 cm MED in Angola (Órgão Official da República de Angola, 2018) and 70 cm MED in Gabon (Republique gabonaise, 2004) as ***A. bipindensis***.

A. quanzensis is selectively logged in Zimbabwe (CITES Management Authority of Zimbabwe *in litt.* to European Commission, 2021) and is listed as a Class 1 timber species in Mozambique, under Ministerial Order No. 52-C/2003 of 20th May 2003 (Government of Mozambique, 2003). MED ranges from 50 cm in Mozambique to 55 cm in Tanzania (Government of Mozambique, 2003; Cunningham, 2016). However, Gérard and Louppe (2011a) reported that the species is typically harvested at smaller diameters in Tanzania.

8.2 Population monitoring

No information on specific population monitoring schemes was found.

8.3 Control measures

8.3.1 International

Lukumbuzya and Sianga (2017) found the regional timber industry within east and southern Africa to be poorly monitored, with harvest and processing, “largely unregulated” and records of target species, companies, and harvest, import and export volumes “largely unavailable” (Lukumbuzya and Sianga, 2017).

8.3.2 Domestic

See Section 8.1

8.4 Captive breeding and artificial propagation

Preliminary results of mixed stand plantation trials in Côte d'Ivoire recommend mixed forest plantations of 13 timber species, including *A. africana*, for wood production and provision of other ecosystem services (CITES MA of Côte d'Ivoire *in litt.* to European Commission, 2020). In the Sudan, *A. africana* is reportedly grown in nurseries and has been cultivated along rivers in several regions (CITES MA of Sudan *in litt.* to European Commission, 2021). Plantation trials of *A. quanzensis* were established in Mozambique in the early 1930s; after 60 years, trees in plantation were found to have shorter trunks and lower branches than wild specimens (Cunningham, 2016). It was noted that plantation production of slow growing hardwood species such as *A. quanzensis* represented a poor economic return and could not reduce harvesting pressure on wild stocks (Cunningham, 2016).

8.5 Habitat conservation

A. africana was noted to occur in several protected areas in the Sudan (CITES MA of Sudan *in litt.* to European Commission, 2021), Benin (Glele Kakai, 2010), Côte d'Ivoire, Ghana, Senegal and Uganda (Hills, 2020). *A. quanzensis* reportedly occurs in protected forest reserves in Zimbabwe (CITES MA of Zimbabwe *in litt.* to European Commission, 2021). All known subpopulations of *A. peturei*, which is threatened by habitat loss, are reported to be outside of protected areas with no known conservation measures in place (Kamau *et al.*, 2021).

8.6 Safeguards

See Section 7.1.

9. Information on similar species

Four *Afzelia* species occur naturally in both mixed deciduous and evergreen forests of Southeast Asia: *A. javanica*, *A. palembanica*, *A. rhomboidea* and *A. xylocarpa* (Donkpegan *et al.*, 2020). *A. javanica* is endemic to Indonesia (Barker, 2021), *A. rhomboidea* occurs in Indonesia, the Philippines (PROSEA, 2016a) and Malaysia (Asian Regional Workshop, 1998), *A. xylocarpa* occurs in Cambodia, Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam (PROSEA, 2016b), and *A. palembanica*, often considered a synonym of *Intsia palembanica*, is widely distributed and occurs in Bangladesh, Brunei Darussalam, India (Andaman Islands), Indonesia, Malaysia, Myanmar, Papua New Guinea and Thailand (Barstow, 2021).

Trade in *A. palembanica* is often reported under the common name "Merbau", which is reported to refer to both *A. palembanica* and *Intsia bijuga* (Barstow, 2021), but may also be used to refer to all *Intsia* spp. (Tong *et al.*, 2009). Based on Eurostat trade statistics, industry comments and assessments of product portfolios of EU-based companies, it was estimated that 30 000 m³ of Merbau was imported by the EU in 2005 (Tong *et al.*, 2009). Although widespread and generally considered common across much of its range, *A. palembanica* (as *I. palembanica*) was categorised as globally Near Threatened in the IUCN Red List in 2021 due to population declines caused by habitat conversion and unsustainable and illegal logging (Barstow, 2021).

With the exception of *A. palembanica*, the only Asian *Afzelia* species reported to be in international trade, and then only "occasionally", is *A. xylocarpa* (Koch pers. comm. to UNEP-WCMC, 2022). At a 2007 regional workshop on sustainable use and management of timber tree species in Southeast Asia, *A. rhomboidea* was not reported to be in international trade (PC17 Inf. 7), although the species was previously noted as "highly valued" domestically for furniture production in the Philippines (Soerianegara and Lemmens, 1993). Limited information was available on harvest of *A. javanica*, although Soerianegara and Lemmens (1993) noted the species was used locally for timber, occasionally as a substitute for *Intsia* spp. On the basis of timber exploitation and habitat loss, *A. rhomboidea* and *A. xylocarpa* were categorised in 1998 as globally Vulnerable and Endangered, respectively, in the IUCN Red List, although both assessments are flagged as in need of updating (Asian Regional Workshop, 1998; Nghia, 1998). *A. javanica* was categorised as globally Least Concern in 2020, on the basis of its large EOO of >330 000 km² (Barker, 2021).

Afzelia spp. and *Intsia* spp. are closely related and wood of the two genera can be confused (Gasson, 2011). It has been noted that "careful examination" of timber is needed in order to distinguish *I. bijuga* from *Afzelia* spp. (Koch *in litt.*, 2015 in Cunningham, 2016). Similarly, expert knowledge and chemical tests are needed in order to differentiate between timber of *A. palembanica* and other *Afzelia* spp., although the Thünen Institute of Forest Genetics has developed genetic markers to identify *Intsia* spp. (Koch pers. comm. to UNEP-WCMC, 2022). Neither *I. palembanica* or *I. bijuga* naturally occur in any of the African *Afzelia* spp.

range States (Barstow, 2020; Barstow, 2021); however, *I. bijuga* has been planted in Tanzania (Asamoah *et al.*, 2012; Barstow, 2020).

10. Consultations

A consultation was distributed by the European Union to all range States in April 2021 and in September/October 2021 (see Annex 1).

11. Additional remarks

Species of *Afzelia* are often not easily distinguishable from one another by logging companies and forest managers, and morphological characteristics are rarely useful for species-level identification (Oshingboye *et al.*, 2017). Although *A. bipindensis* and *A. pachyloba* have recently been distinguished from one another based on the chemical signature of heartwood samples in the laboratory (Kitin *et al.*, 2021), individual species within the genus *Afzelia* cannot be distinguished from one another using standard microscopy (Thünen Institute of Forest Genetics, 2015), and according to Beeckman (*in litt.* to UNEP-WCMC, 2020), it is not possible to distinguish *Afzelia* species based on the wood anatomical features. Da Silva *et al.* (2017) reported that transverse wood anatomical features in *Afzelia* species are fairly uniform within the genus; despite some intra-species variability in vessel size and density, there are no other distinctive features that could help in identification at species level. For these reasons, it is important that all species of *Afzelia* occurring in Africa are included in Appendix II.

Although there appears less difficulty in identification between the two genera *Khaya* spp. and *Afzelia* spp., both are referred to in trade as “African mahogany” (Oni and Igboanugo, 2007; Balima *et al.*, 2018).

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Annex 1: Summary of range State responses

Range State	Response
Angola	Unclear, noting that <i>Azelia</i> spp. in Angola are in “relative ecological balance”, although a field survey would be beneficial.
Benin	Supports listing in Appendix II
Botswana	Wishes to unreservedly associate itself with the proposal
Burkina Faso	
Burundi	Supports listing in Appendix II
Cameroon	
Central African Republic	
Chad	Supports listing in Appendix II
Congo	
Côte d'Ivoire	
Democratic Republic of the Congo	
Equatorial Guinea	Supports listing in Appendix II
Eswatini	
Gabon	
Ghana	Still under consideration
Guinea	
Guinea Bissau	
Kenya	
Liberia	Supports listing in Appendix II
Malawi	Supports listing in Appendix II
Mali	
Mozambique	Unclear, noting that other timber species in Mozambique may be in greater need of CITES listing.
Namibia	
Niger	
Nigeria	
Senegal	Supports listing in Appendix II
Sierra Leone	
Somalia	
South Africa	No objection to the proposed listing
Republic of South Sudan (non-Party)	Supports listing in Appendix II
Sudan	Supports listing in Appendix II (specifically referred to <i>A. africana</i>).
Togo	
Uganda	Supports listing in Appendix II
United Republic of Tanzania	
Zambia	Supports listing in Appendix II
Zimbabwe	Status in Zimbabwe does not warrant CITES listing.

Annex 2: National legal instruments

Range State	Legal protection
Angola	In January 2018, the Ministry of Agriculture reportedly banned the exploitation of forest resources, including felling, movement and transportation of logs (Macauhub, 2018). However, it is unclear if this legislation is still in place, as the CITES MA of Angola reported licensed harvest volumes for <i>Azelia</i> species in 2019, 2020 and 2021 (CITES MA of Angola <i>in litt.</i> to the European Commission, 2022).
Benin	<i>A. africana</i> was listed as a protected species by Decree 96-271 of July 1996 (Republic of Benin, 1996); the felling, delimiting or cutting of protected plant species was prohibited by Article 36 of the Forest Code (Law 93-009) unless exempted by the Forest Administration (Republic of Benin, 1993). Since January 2018, national authorities were reported to have taken steps to prohibit exploitation of <i>A. africana</i> including for local use (CITES MA of Benin <i>in litt.</i> to European Commission, 2021). Article 8 of Interministerial Decree 2007/0053/MEPN/MIC/DC/SGM/DGFRN/DGCE prohibits national transit and re-export of raw and unprocessed timber (Republic of Benin, 2007).
Botswana	Statutory Instrument 53 of 1981 listed <i>A. quanzensis</i> as a protected tree species (CITES MA of Botswana <i>in litt.</i> to European Commission, 2021). Under Chapter 38:03 of the Forest Act, unlicensed felling, cutting, working, or burning of such species is prohibited (Government of Botswana, 1968).
Burkina Faso	<i>A. africana</i> was listed as a protected species that cannot be cut, felled, uprooted or burnt unless authorised by the competent forest authority by Order No. 2004-019/MECV of 7 th July 2004 (Government of Burkina Faso, 2004). However, it is unclear whether this protection remains in place as the Order was associated with implementation of the country's 1997 Forest Code (Law No. 006/97/ADP), which was repealed in 2011 by a new Forest Code (Government of Burkina Faso, 2011).
Burundi	Under Law No. 1/07 of 15 th July 2016, harvested trees must be replaced with trees of the same species (Republic of Burundi, 2016).
Cameroon	Annex I-B of the FLEGT Voluntary Partnership Agreement between the European Union and Cameroon prohibited export of Red Doussié (<i>A. bipindensis</i>) and Apa/White Doussié (<i>A. pachyloba</i>) logs (The European Union and The Republic of Cameroon, 2011). Note that this does not apply to sawn timber and processed logs.
Central African Republic	A Decision (current status unclear) by the Minister of Water, Forestry, Hunting and Fishing in 2003 suspended all timber logging and export unless authorised on a case-by-case basis (Le Ministre des Eaux Forêts Chasses et Pêches du République Centrafricaine, 2003).
Chad	The export of wood and charcoal, and corporate national use, was prohibited by Order No. 025/MEERH/SECHVP/SG/DFLCD/2008 of 6 th August 2008 (OFAC, 2013).
Congo	Article 48 of the Forest Code (Law No. 16-2000 of 20 th November 2000) prohibited export of raw logs and mandated that wood products could only be exported in finished or semi-finished form (Government of Congo, 2000).

Côte d'Ivoire	Decree 2013-816 of 26 th November 2013 banned exploitation, transport, processing and export of timber species from forests located above the 8 th parallel of latitude (CITES MA of Côte d'Ivoire <i>in litt.</i> to European Commission, 2020), although it is unclear whether this region would include <i>Azelia</i> spp. distribution.
Democratic Republic of Congo	
Equatorial Guinea	
Eswatini	
Gabon	A ban on export of unprocessed logs was reportedly put in place in May 2010 (Mongabay, 2010).
Ghana	
Guinea	The cutting, transport and export of timber throughout the national territory was banned in 2010 (Arrêté/A/N°7220/PM/SGG of 30/12/2010), although logging and transport of timber exclusively for local consumption has since been authorised (CITES MA of Guinea <i>in litt.</i> to UNEP-WCMC, 2020a, 2020b).
Guinea-Bissau	Law-Decree No. 05/2011 of the Forest Code prohibits the export of logs (Republic of Guinea Bissau, 2011). In 2015, a moratorium on logging and log exports was reportedly put in place (Reuters, 2015). However, in January 2021 it was reported that a decree had been drafted to lift the moratorium (Mongabay, 2021).
Kenya	
Liberia	
Malawi	A. quanzensis was listed as a protected species by Government Notice No. 89 of 30 th March 1994 (Government of Malawi, 1994).
Mali	A. africana was classed as a partially protected species by Decree No. 10-387/P-RM of 26 th July 2010 (Republic of Mali, 2010). Interministerial Decree No. 2015-1536/CI/MEF-SG of 5 th June 2015 banned export of unprocessed wood products and charcoal (Republic of Mali, 2015), and Decision No. 0016/MEADD-SG DU of 27 th May 2020 suspended all exploitation of timber and sawn timber in Mali until further notice (Republic of Mali, 2020).
Mozambique	A. quanzensis is listed as a Class I commercial timber species, meaning that exports of the species in raw log form are prohibited (Boletim da Republica Mozambique, 2002). A raw log export ban was put in place in 2007 (CIFOR, 2014).
Namibia	
Niger	
Nigeria	Export of rough or sawn timber, as well as round and roughly squared wood, is prohibited (Nigeria Customs Service, 2020).
Senegal	A. africana was classed as a partially protected species by Decree No. 2019-110 of 16 th January 2019, which implements the 2018 Forest Code (Republic of Senegal, 2019).

Sierra Leone	A log export ban was reportedly put in place in 2007 (Munro and Hiemstra-van der Horst, 2012) and although the ban has been temporarily lifted on several occasions to allow exports of stockpiled logs, it was reportedly reinstated in April 2018 (Sewa News Stream, 2018).
Somalia	
South Africa	
Republic of South Sudan	A wood and charcoal export ban was reportedly put in place in July 2018 (Sudan Tribune, 2018).
Sudan	
Togo	A. africana was reportedly listed as a protected species by Decision No. 233/AE of the 18 th April 1947, which implemented the 1938 Forest Code (MERF, 2011). However, the 1938 Forest Code was repealed and replaced with a new Forest Code on 19 th June 2008 (Government of Togo, 2008), and it appears that no implementing decree for plant species protection has since been adopted (CoP17 Inf. Doc. 79).
Uganda	A national ban on exports of raw timber has reportedly been adopted (Sunday Vision, 2018).
United Republic of Tanzania	Log exports are prohibited by the Forest Act and Forest Regulations (Government of United Republic of Tanzania, 2002).
Zambia	A. quanzensis logs were classed as controlled goods under Statutory Instrument No. 27 of 24 th March 2017, and thus may be subject to import and export restrictions or bans (Government of Zambia, 2017).
Zimbabwe	