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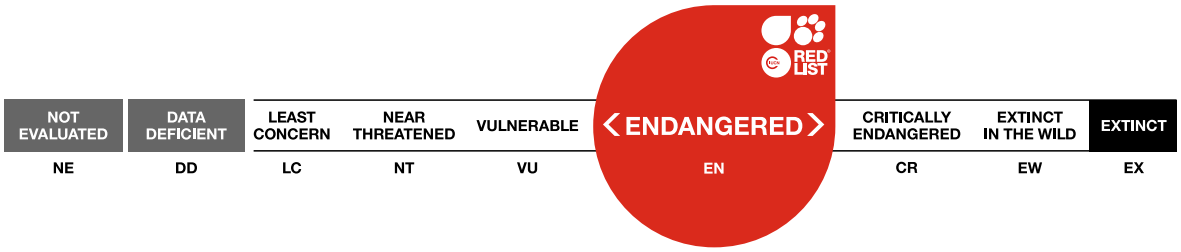
Fraxinus dimorpha, Wild Ash

Errata version

Assessment by: Rankou, H., M'Sou, S., Alifriqui , M. & Martin, G.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Plantae	Tracheophyta	Magnoliopsida	Scrophulariales	Oleaceae

Scientific Name: *Fraxinus dimorpha* Coss. & Durieu

Synonym(s):

- *Fraxinus dimorpha* var. *dumosa* Carrière
- *Fraxinus xanthoxyloides* auct.
- *Fraxinus xanthoxyloides* var. *dumosa* (Carrière) Lingelsh.
- *Fraxinus xanthoxyloides* fma. *dumosa* (Carrière) Rehder
- *Fraxinus xanthoxyloides* var. *dimorpha* (Coss. & Durieu) Wenz.
- *Fraxinus xanthoxyloides* fma. *dumosa* (Carrière) Rehder

Common Name(s):

- English: Wild Ash
- French: Frêne dimorphe
- Arabic: Derdar, Imts (Amazigh)

Assessment Information

Red List Category & Criteria: Endangered A2cd+3cd+4cd; B2ab(i,ii,iii,v) ver 3.1

Year Published: 2017

Date Assessed: August 28, 2017

Justification:

Fraxinus dimorpha is a western Mediterranean species, endemic to North Africa with a restricted distribution in Morocco and Algeria. *Fraxinus dimorpha* is very local, uncommon and fairly rare in most of its stations and the abundance of the species varies from rare to occasional and the populations are severely fragmented. The population trend of *Fraxinus dimorpha* is decreasing, the number of mature individuals and the population density have been significantly reduced during last decades, and the species often occurs in small subpopulations. The population reduction is inferred to be very high at 70 % over the last three generation and is projected to continue declining by 50% in the future due to many threats. The estimated area of occupancy (AOO) is less than 500 km² and the species is under numerous medium to high impact threats, especially: ruthless collection for domestic uses and for trade, collection practices, overgrazing, deforestation, human activities, management activities and climate change with an estimated continuing decline in the population size and the habitats quality on all the locations. Therefore, *Fraxinus dimorpha* is assessed globally as Endangered [EN A2cd+3cd+4cd; B2ab (i,ii,iii,v)].

Geographic Range

Range Description:

Fraxinus dimorpha is a western Mediterranean species, endemic to North Africa with a restricted distribution in Morocco and Algeria (Ball 1878, Battandier and Trabut 1890, Fennane and Ibn Tattou

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2005, Fennane *et al.* 2007, Charco 2001, Euro+Med 2015). In Algeria, *Fraxinus dimorpha* occurs mainly in the Aurès (Oued Ensigha, Oued Boulgem and Oued Tamza), Djebel Tougour near Batna Province, Oued Abdi Valley near Constantine province, Bellezma, Djbel-M'zi, Toudja and Kabylie Mountains (Battandier and Trabut 1890, Charco 2001). In Morocco, *Fraxinus dimorpha* occurs in the following major floristic divisions: High Atlas Mountains (Ayachi, Maâsker, Parc National, Ourika Valley near Marrakech), Central High Atlas mainly in Ait M'hamed near Azilal Province at 1,300 to 1,700 m altitude, Middle Atlas Mountains (Nort-Eastern of Middle Atlas and Central Middle Atlas), Anti Atlas (Saghro Mountains), Eastern-Land and Mountains (Berkine) and Atlas Saharien (Ball 1878, Battandier and Trabut 1890, Fennane and Ibn Tattou 2005, Fennane *et al.* 2007, Taleb and Fennane 2008, Charco 2001, Euro+Med 2015). *Fraxinus dimorpha* can be found between 1,400 m and 2,500 m of altitude. The estimated extent of occurrence (EOO) is 246,306 km² and the estimated area of occupancy (AOO) is estimated 100 km².

Country Occurrence:

Native, Extant (resident): Algeria; Morocco

Population

Fraxinus dimorpha is very isolated and scattered in most of its localities. The abundance of the species varies from rare to occasional and most of the subpopulations are very fragmented. In Morocco, *Fraxinus dimorpha* is very local, fairly uncommon and the subpopulations size varies from rare (most of the subpopulations are scattered and small of 15 to 50 trees/ha) to occasional (50 to 500 trees/ha) (Genin *et al.* 2016). The regional surface area of *F. dimorpha* stands has not yet been formally characterised, but the tree stands form discontinuous patches found mainly throughout the northern part of the High Atlas and in the Middle Atlas (Genin *et al.* 2016). In Algeria, *Fraxinus dimorpha* is very local and fairly rare, occurs in small montane areas, very fragmented with low density and number of mature individuals (INRA 2012).

The overall trend of the population is decreasing. The number of mature individuals and the population density of *Fraxinus dimorpha* are significantly reduced during last decades. The population reduction is inferred to be very high of 70 % over the last three generations and is projected to continue declining at least by 50% in the future due to various factors and many threats.

Current Population Trend: Decreasing

Habitat and Ecology **(see Appendix for additional information)**

Fraxinus dimorpha has typical habitats that include pastures, mountain plain, river banks, river beds, ravines, woodlands clearings, steep hills and Mediterranean forest (Battandier and Trabut 1890, Fennane *et al.* 2007, Charco 2001, Genin *et al.* 2016). *Fraxinus dimorpha* is a xerophytic plant that prefers arid and semi-arid, cool temperate and Mediterranean climates with a temperature between -20 to 35 °C. The species tolerates also very hot and dry climate of the mountains bordering the Sahara (Emberger 1938, Genin *et al.* 2016). *Fraxinus dimorpha* grows in limestone or siliceous rocks of low and medium mountains; it prefers open and sunny habitats but can be found in mid-shaded habitats. The species flowers from February to March and produces fruit from July to September (Emberger 1938, Charco 2001, Genin *et al*. 2016). The flowers of *Fraxinus dimorpha* are apetalous and wind pollinated. *Fraxinus dimorpha* is often found in association with *Quercus ilex* forming *Querco-Juniperetalia* order (Barbero *et al*. 1981) and *Fraxino-Quercetum* associations which are strongly represented in the central and eastern High Atlas (Rhanem 1985, Taleb and Fennane 2008). The propagation of the species can be done by seeds as well as by vegetative means.

Systems: Terrestrial

Use and Trade

Fraxinus dimorpha has been used in folk medicine for its diuretic, laxative, antirheumatic and mild purgative effects as well as for treating constipation, dropsy, arthritis, rheumatic pain, cystitis, animal bone fracture and itching scalp (Bellakhdar 1997, Kostova and Iossifova 2007, M'Sou 2013). The fruits and seeds of *F. dimorpha,* locally called 'Isan-tir', are used as spices for their culinary, medicinal and aphrodisiac qualities. Seeds are also used to flavour some drinks like "Khodenjal" a Moroccan traditional drink and coffee (Bellakhdar 1997, M'Sou 2013). *Fraxinus dimorpha* is an important livelihood and agroforestry species in the Moroccan High Atlas. Here it is used for multiple purposes, for example; forage (leaves and seeds when available), timber (poles, beams, and handles for tools), firewood, food, alimentary, traditional medicinal and dyes (Bellakhdar1997, M'Sou 2013, Genin *et al.* 2016).

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Fraxinus dimorpha is characterised by the presence of coumarins, secoiridoids (glucosides and esters of hydroxyphenylethyl alcohols), phenylethanoids. lignans, flavonoids and simple phenolic compounds (Kostova and Iossifova 2007). The main compound group of the essential oil of the species is sesquiterpenes with (E)-nerolidol. The seeds and leaves of *F. dimorpha* contain mainly the tannic compounds, coumarins and phenolic substances (M'Sou 2013, Genin *et al.* 2016).

Threats (see Appendix for additional information)

The population and the habitats of *Fraxinus dimorpha* are locally declining due to numerous medium to high impact threats, especially: ruthless collection for domestic uses and for trade, collection practices, overgrazing, deforestation and soil erosion (Bellakhdar 1997, Barbero *et al.* 1990, M'sou 2013, Genin *et al.* 2016, H. Rankou and S. M'sou pers. comm. 2017). *Fraxinus dimorpha* is overexploited for wood, fodder and seeds uses. The species is heavily collected by locals and collectors for domestic uses as a remedy or to trade nationally with local herbalists. Within in Morocco the species is traded and it is 70–100 dirhams/kg for the seeds and 40–55 dirhams for 1 m of the wood (H. Rankou and S. M'sou pers. comm. 2017). *Fraxinus dimorpha* is also threatened by the new management of public forests and the poor recognition of the traditional sustainable forest management (Genin *et al.* 2016, Barbero *et al.* 1990, H. Rankou and S. M'sou pers. comm. 2017). *Fraxinus dimorpha* is threatened more generally by the direct and indirect impact of human activities such as leisure activities, tourism, infrastructure development, long periods of drought and climate change (Benabid 2002, Plan Bleu 2009, Taleb and Fennane 2011).

Conservation Actions (see Appendix for additional information)

In Morocco, *Fraxinus dimorpha* is managed traditionally as an important livelihood species. One stand of ash tree of the Aït M'Hamed Commune is a public forest managed by State foresters, but where access to livestock browsing and some cutting is informally allowed (Genin *et al.* 2016). Tree exploitation and management of the species in the area of the High Atlas studied by Genin *et al.* 2016, follows a very precise sequence. It encompasses, on single living trees, overlapping cutting cycles of four years in order to produce fodder foliage, associated with eight-year cycles for the purpose of producing poles. Sometimes, particularly vigorous poles are conserved in order to produce beams in about 30-year cycles. The traditional, sustainable forest management system for this species is poorly recognised by forest and agriculture authorities in Morocco, who consider any cutting of living wood by local people as a legal offence. In Algeria, *Fraxinus dimorpha* is protected by the executive Decree n° 12–03 of 10 Safar 1433 corresponding to 4 January 2012 establishing the list of uncultivated species of vegetation protects, published in the official journal of Algeria n°03, 2012. *Fraxinus dimorpha* is cultivated successfully *ex situ* and the following actions are recommended to conserve the species and its native habitats;

- Protection of the species and sites from habitat loss and fragmentation, deforestation, over-collection and overgrazing.
- Cultivated plants should be used in trade and domestic uses instead of wild plant.
- Improve local practices of cutting and the time of collecting the species.
- Fencing the vulnerable sites to protect the species from overexploitation, overgrazing, trampling and ruthless collection.
- The creation of protected areas to ensure complete regeneration of the species, ecosystems and to restore the quality of wild environments.
- Recognition of the traditional sustainable forest management and conservation cultural practices.

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• Raising of public awareness and identifying priorities.
• *Ex situ* conservation: artificial propagation, reintroduction, seed collections.
• Monitoring and surveillance of the existing populations and sites.
• Estimation of population sizes and study of their dynamics, trends, biology and ecology.
• Protection of living individuals of the species through legislation and legal protection which ban the species being picked or dug up.
• Enforcement of the legal protection measures (Law on the protection and the enhancement of the environment, Law on the studies of impact).
• Pastoral, silvo-pastoral improvement and organisation of pastoralists through establishment of a rotation system for pasture.
• Participative approaches with communities and local people for implementing the conservation actions.

Credits

Assessor(s): Rankou, H., M'Sou, S., Alifriqui , M. & Martin, G.

Reviewer(s): Jury, S., Barstow, M. & Rivers, M.C.

Partner(s) and Institution(s): Botanic Gardens Conservation International

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External Resources

For Supplementary Material, and for Images and External Links to Additional Information, please see the Red List website.

Appendix

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

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.4. Forest - Temperate	Resident	Suitable	Yes
3. Shrubland -> 3.4. Shrubland - Temperate	Resident	Suitable	-
3. Shrubland -> 3.8. Shrubland - Mediterranean-type Shrubby Vegetation	Resident	Suitable	-

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

Plant Growth Form
TL. Tree - large

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

End Use	Local	National	International
Construction or structural materials	No	No	Yes
Medicine - human & veterinary	No	No	Yes
Food - animal	No	No	Yes
Research	No	No	Yes
Other household goods	No	No	Yes
Food - human	No	No	Yes

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

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		

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2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.2. Small-holder farming	Ongoing	Majority (50-90%)	Rapid declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
2. Agriculture & aquaculture -> 2.2. Wood & pulp plantations -> 2.2.1. Small-holder plantations	Ongoing	Majority (50-90%)	Rapid declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.1. Nomadic grazing	Ongoing	Whole (>90%)	Very rapid declines	High impact: 9
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.2. Small-holder grazing, ranching or farming	Ongoing	Whole (>90%)	Rapid declines	High impact: 8
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
5. Biological resource use -> 5.2. Gathering terrestrial plants -> 5.2.1. Intentional use (species is the target)	Ongoing	Majority (50-90%)	Very rapid declines	High impact: 8
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
5. Biological resource use -> 5.3. Logging & wood harvesting -> 5.3.2. Intentional use: (large scale) [harvest]	Ongoing	Majority (50-90%)	Very rapid declines	High impact: 8
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
6. Human intrusions & disturbance -> 6.1. Recreational activities	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		

6. Human intrusions & disturbance -> 6.3. Work & other activities	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
7. Natural system modifications -> 7.3. Other ecosystem modifications	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
9. Pollution -> 9.3. Agricultural & forestry effluents -> 9.3.2. Soil erosion, sedimentation	Ongoing	Majority (50-90%)	Rapid declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.2. Species disturbance		

Conservation Actions in Place

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

Conservation Action in Place
In-place species management
Subject to ex-situ conservation: Yes

Conservation Actions Needed

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

Conservation Action Needed
1. Land/water protection -> 1.1. Site/area protection
2. Land/water management -> 2.1. Site/area management
2. Land/water management -> 2.3. Habitat & natural process restoration
3. Species management -> 3.1. Species management -> 3.1.1. Harvest management
3. Species management -> 3.1. Species management -> 3.1.2. Trade management
3. Species management -> 3.3. Species re-introduction -> 3.3.1. Reintroduction
3. Species management -> 3.4. Ex-situ conservation -> 3.4.1. Captive breeding/artificial propagation
3. Species management -> 3.4. Ex-situ conservation -> 3.4.2. Genome resource bank
4. Education & awareness -> 4.2. Training
4. Education & awareness -> 4.3. Awareness & communications
5. Law & policy -> 5.1. Legislation -> 5.1.2. National level

Conservation Action Needed
6. Livelihood, economic & other incentives -> 6.1. Linked enterprises & livelihood alternatives

Research Needed

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

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.4. Harvest, use & livelihoods
1. Research -> 1.6. Actions
2. Conservation Planning -> 2.3. Harvest & Trade Management Plan
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.3. Trade trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km²): 100
Continuing decline in area of occupancy (AOO): Yes
Estimated extent of occurrence (EOO) (km²): 246306
Continuing decline in extent of occurrence (EOO): Yes
Number of Locations: 8
Lower elevation limit (m): 1,400
Upper elevation limit (m): 2,500
Population
Continuing decline of mature individuals: Yes
Population severely fragmented: Yes
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 35-40

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Errata

Errata reason: This erratum version of the assessment was created to correct some minor grammar errors in the text. The species' range map has also been removed; previously it was accidentally published.

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