The IUCN Red List of Threatened Species™
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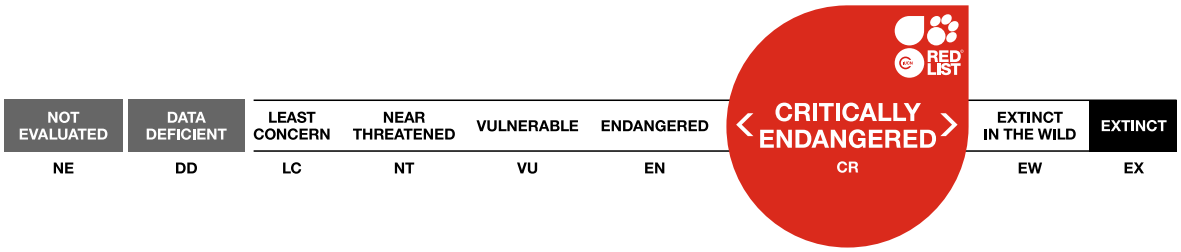
Paspalum lilloi

Assessment by: Reutemann, A.V. & Honfi, A.I.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Plantae	Tracheophyta	Liliopsida	Poales	Poaceae

Scientific Name: *Paspalum lilloi* Hack.

Taxonomic Source(s):

Board of Trustees, RBG Kew. 2021. Plants of the World Online Portal. Richmond, UK. Available at: http://www.plantsoftheworldonline.org.

Assessment Information

Red List Category & Criteria: Critically Endangered B1ab(iii)+2ab(iii) ver 3.1

Year Published: 2022

Date Assessed: September 27, 2021

Justification:

With all the information compiled, this is a range-restricted species, known from 1 location in the Iguazu Waterfalls, in northeastern Argentina and southern Brazil. Its extent of occurrence (EOO) and area of occupancy (AOO) are 8 km². It is a reophile and rupicole species, well adapted to fast stream rivers and waterfalls. In the past, its EOO and the number of subpopulations declined due to habitat loss caused by human settlements, leading to the putative local extinction of a Paraguayan subpopulation; nowadays the main threat to its habitat is river-flow fluctuation caused by rainfall regimes and dam constructions. Fortunately, the remnant subpopulations are circumscribed in two protected areas belonging to the National Park of Iguazú in Misiones (Argentina) and the National Park of Iguaçú in Paraná (Brazil), but this cannot protect the species against continuing habitat decline due to river-flow fluctuation. The species is listed as Critically Endangered (CR).

Geographic Range

Range Description:

Paspalum lilloi Hack. is currently known only in the Iguazú Waterfalls, in the limits of the State of Misiones, in Northeastern Argentina and the State of Paraná, in South Brazil. The species' extent of occurrence (EOO) is estimated at 3.04 km² (based on the total area within a minimum convex polygon around all known occurrences), and the area occupied (AOO) within this EOO is estimated at 8 km² (based on a 2x2 km² grid overlay on the range map; see Reutemann *et al*. 2021). As the EOO is smaller than the AOO, the correct EOO will be 8 km². This is the only known subpopulation at present, therefore the species occurs in only one location. Although this location is within two protected areas, the National Park of Iguazu (Argentina) and the National Park of Iguaçu (Brazil), the main threat (habitat loss) appears to affect both of these areas.

Country Occurrence:

Native, Extant (resident): Argentina (Misiones); Brazil (Paraná)

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Native, Possibly Extinct: Paraguay

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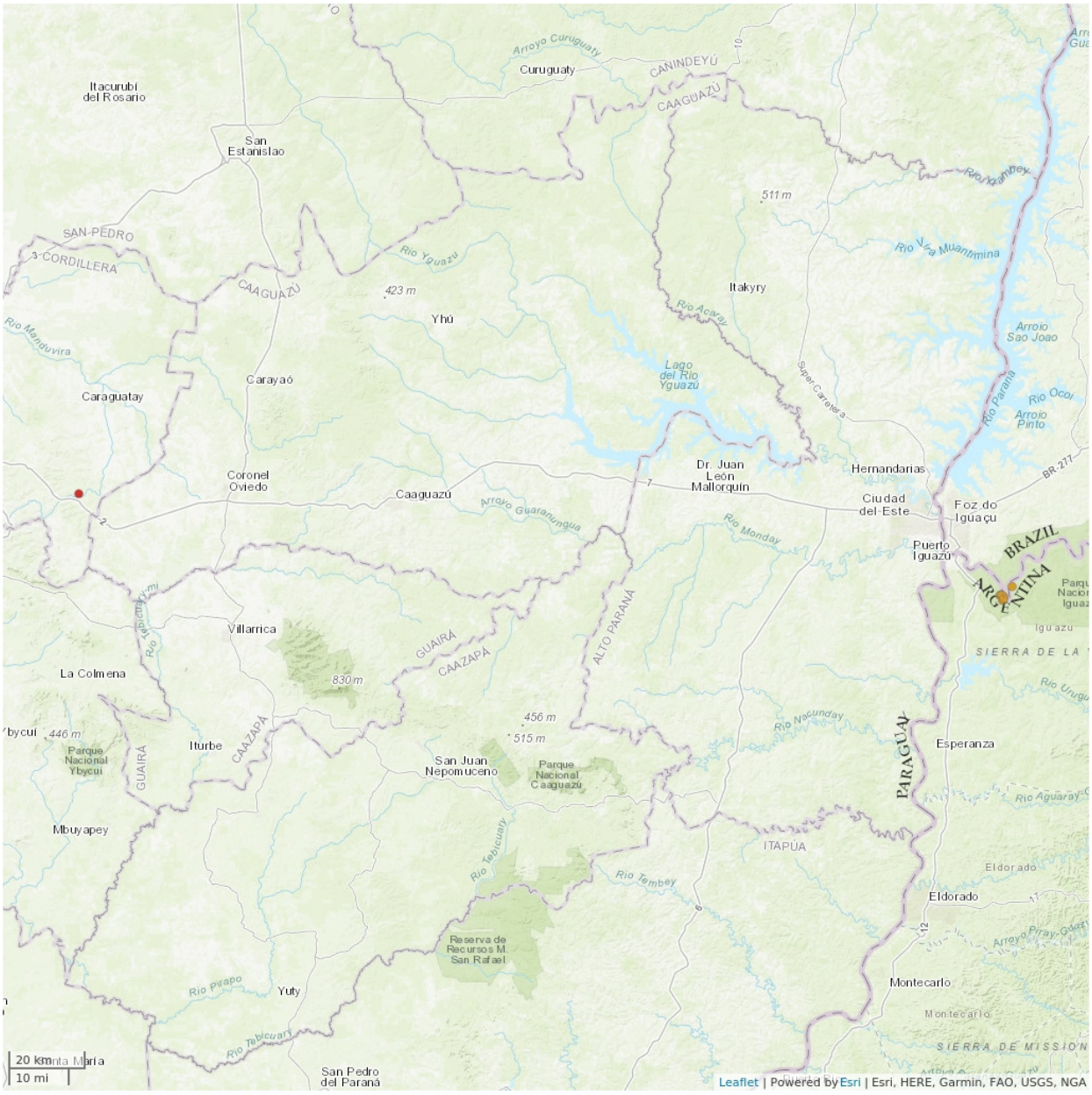
Distribution Map



Legend

- EXTANT (RESIDENT)
- EXTINCT

Compiled by:

Reutemann, A. V., Martinez, E. J., Rua, G. H., Schedler, M., Daviña, J. R. and Honfi, A. I. 2021

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

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Population

Studying the herbarium specimens of *Paspalum lilloi*, we observed that until 1914 the species was recorded in Paraguay. However, nowadays the species is missing in this location, mainly due to urban expansion in the area, and no collections were reported in the latest review publication of the genus in this country (Zuloaga *et al*. 2014). Between 1900 and 2021, the species was continuously observed and collected in the National Park of Iguazu in Misiones (Argentina), and between 1946-2018 in the Brazilian side of the Iguazu Waterfalls, in the state of Paraná, within the National Park of Iguaçu (Zuloaga and Morrone 2005, Hojsgaard *et al*. 2009). More research is needed to investigate the dynamics of the natural populations of *P. lilloi*, but based on existing information it is suspected that the population has genuinely declined at least in the Paraguayan location. Nevertheless, there are no data available for this species' population trends yet, and efforts will be made to study the population dynamics of this species.

Current Population Trend: Unknown

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

Paspalum lilloi is a grass species with a restricted distribution bounded to the Iguazú Waterfalls (Argentina - Brazil) on the Iguazú River. This grass is considered endemic to this area and has a low dispersal capacity, due to its ecological specialization. It is a reophile species, highly adapted to damp to flooded rocky soils, with permanent running waters and high levels of relative humidity, even permanent mist. Within the National Parks, *P. lilloi* inhabits bodies of water, forming monospecific hygrophilous grasslands in the upper edge of the falls, and even in the vertical walls of the Devil's Throat (specific circuit inside the Argentinian National Park), where the water flow has the greatest volume and strength-drag. It is a rupicolous species firmly rooted in stones and resistant to the drag force of the water flow. Due to its habitat requirements this species was considered as adapted to terrestrial and freshwater environments.

Systems: Terrestrial, Freshwater (=Inland waters)

Use and Trade **(see Appendix for additional information)**

No use or trade is known for this species. Luckily, its extremely specialized habitat and being included in two protected areas make it difficult to access.

Threats **(see Appendix for additional information)**

The major threat affecting this species is the fluctuation in the water level and flow of the Iguazu River, caused by seasoned rainfalls in the subtropics and dam construction. Urban expansion and tourist area development were major threats in the past, as they advanced over the suitable habitat of the species, for example in the Paraguayan location and in the touristy area of Argentinian and Brazilian National Parks at the Iguazú Waterfalls.

Future threats to be considered are hydroelectric dam constructions in Brazil and Argentina. For example, over Iguazu River there are already five dams in Brazil, and over the Parana River, there are 57 dams in Brazil and one dam (three more projected) in Argentina. There is strong evidence on the influence of Brazilian Dams (e.g. Baixo Iguaçu Dam) over the Iguazu River flow and, consequently, the

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waterfalls in it. The loss of habitat due to fluctuations in the water regime affects the survival of this hygrophile species.

Conservation Actions **(see Appendix for additional information)**

As commented before, the remnant subpopulations of *Paspalum lilloi* are included within two protected areas. One of them is the National Park of Iguazú, in the state of Misiones (Argentina) and the other one, with the same name -National Park of Iguaçú- in the state of Paraná (Brazil). Currently this is the only known location for the species.

Credits

Assessor(s): Reutemann, A.V. & Honfi, A.I.

Reviewer(s): Lansdown, R.V., Bilz, M. & Fernandez, E.

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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?
4. Grassland -> 4.6. Grassland - Subtropical/Tropical Seasonally Wet/Flooded	Resident	Suitable	Yes
5. Wetlands (inland) -> 5.1. Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)	Resident	Suitable	Yes

Plant Growth Forms

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

Plant Growth Form
GR. Graminoid

Threats

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

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Past, likely to return	Unknown	Unknown	No/negligible impact: 0
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
1. Residential & commercial development -> 1.3. Tourism & recreation areas	Past, unlikely to return	Unknown	Unknown	Past impact
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.11. Dams (size unknown)	Future	Majority (50-90%)	Causing/could cause fluctuations	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Ongoing	Majority (50-90%)	Causing/could cause fluctuations	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
11. Climate change & severe weather -> 11.5. Other impacts	Past, likely to return	Unknown	Unknown	No/negligible impact: 0
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		

Conservation Actions in Place

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

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: Yes
In-place species management
Subject to ex-situ conservation: Yes
In-place education
Subject to recent education and awareness programmes: Yes

Conservation Actions Needed

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

Conservation Action Needed
3. Species management -> 3.4. Ex-situ conservation -> 3.4.2. Genome resource bank
4. Education & awareness -> 4.3. Awareness & communications
5. Law & policy -> 5.1. Legislation -> 5.1.1. International level
5. Law & policy -> 5.1. Legislation -> 5.1.2. National level

Research Needed

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

Research Needed
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km²): 8
Continuing decline in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km²): 8
Continuing decline in extent of occurrence (EOO): Unknown
Number of Locations: 1
Continuing decline in number of locations: Unknown
Lower elevation limit (m): 190

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Distribution
Upper elevation limit (m): 195
Population
Population severely fragmented: No
No. of subpopulations: 2
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes

The IUCN Red List Partnership

The IUCN Red List of Threatened Species™ is produced and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission (SSC) and The IUCN Red List Partnership.

The IUCN Red List Partners are: ABQ BioPark; Arizona State University; BirdLife International; Botanic Gardens Conservation International; Conservation International; Missouri Botanical Garden; NatureServe; Re:wild; Royal Botanic Gardens, Kew; Sapienza University of Rome; Texas A&M University; and Zoological Society of London.