ANNEX V – MASTER PLAN FOR THE SÃO PAULO BOTANIC GARDEN

This ANNEX submits proposals for environmental interventions in land use, in building projects, and in the management of live plant collections at the Botanic Garden of São Paulo - 2020. MASTER PLAN maps shall be consulted on the Botanic INSTITUTE's homepage for better viewing at the appropriate scale.

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1. PREFACE

A **botanic garden Master plan** can be defined, generically, as the instrument used for ordering the physical space of the botanic garden, for controlling its natural and cultural heritage, and for planning by the administration, guiding priorities, actions and transformations, public and private investments and private, having as references the fulfillment of its institutional mission and the preservation of its scientific, natural, landscape, archaeological and historical-cultural values (Master Plan of the Rio de Janeiro Botanic Garden Research Institute, 2003).

The **Master Plan of the São Paulo Botanic Garden** is intended to be a document that includes the zoning of the visiting area of the São Paulo Botanic Garden (Jardim Botânico de São Paulo - JBSP), covering the six “landscape units” referenced in this plan, and guiding the management and administration rules, the management of living collections and the preservation and maintenance of JBSP's scientific, architectural, cultural and historical heritage, according to its mission.

All proposals presented herein shall provide the administration of the São Paulo Botanic Garden with information for carrying out actions that are consistent with their development and shall establish guidelines for the execution of future plans that may be implemented by the institution. Currently, it is up to the director of the Botanic Garden and Reserves Research Center (Centro de Pesquisas Jardim Botânico e Reservas - CPJBR) to monitor its execution, as well as its review every two years. It is also up to the director to establish the Technical Council to provide advice on the actions that will culminate in the fulfillment of the established goals.

This document follows the guidelines of the “Master Plan and Proposal for Environmental Intervention in the use of soil and building projects in the visitor area of the São Paulo Botanic Garden for the period ranging from 2007 to 2010 (SMA Process 20.249/07)”; suggestions submitted in Rocha (1999); and guidelines in the Darwin Technical Manual for Botanic Gardens (1999).

Thus, all actions developed at the JBSP, as well as interventions, shall be analyzed by the Director of the Botanic Garden and Reserves Research Center, assisted by the Technical Support Council for the Implementation of the Management and Conservation Plan of the State Park Ipiranga Springs (Parque Estadual das Fontes do Ipiranga - PEFI), established by Directive IBT 018/2013, of 12/09/2013 (published on 12/11/2013).

This master plan, an instrument that guides the rules of management, administration, management of living collections and the preservation and maintenance of JBSP's scientific, architectural, cultural and historical heritage, will aim to identify current needs, existing problems and ways of solving them. them, as well as the definition of restrictions and permissibility to use the physical spaces of the garden, more specifically in the six “landscape units”: Fernando Costa, Martius, Linnaeus, Ninfeia and Hoehne, proposed by Rocha (1999) and in the Arboretum Unit, separated from the Martius Unit by a decision adopted by the Technical Council.

The georeferencing system used for all units is the SIRGAS 2000 - UTM.

2. INTRODUCTION

2.1. HISTORY OF THE SÃO PAULO BOTANIC GARDEN

At the end of the 19th century, the area of the State Park Ipiranga Springs was a vast region with native forest and occupied by farmers and ranchers. Government-ordered expropriations aiming at the recovery of the forest, the use of water resources and the preservation of the springs of Ipiranga stream had been occurring in the area since 1893. In 1917, the region became the property of the government, and its name was changed to Parque do Estado (State Park). Until 1928, it served to capture the water that supplied the neighborhood of Ipiranga. That same year, naturalist Frederico Carlos Hoehne was invited by the São Paulo Secretary of Agriculture, Industry and Commerce, Dr. Fernando Costa, to establish a botanic garden in this area.

This important challenge was accepted by Hoehne, who started the construction of a botanic garden--which, until then, did not exist in the city of São Paulo. The first construction project started with the creation of two lakes, from the damming of the Pirarungáua stream, and the Garden of Linnaeus, inspired by a part of the Uppsala Botanic Garden, in Sweden, and comprised by the São

Paulo Orchidarium, two greenhouses with iron structures imported from England, two staircases, and a basin with a reflecting pool.

Construction of the Garden of Linnaeus, 1920s

[Construction of the Garden of Linnaeus, 1920s]

Hoehne built, behind the greenhouses, the pergolas to house the collection of orchids, the embryo of the future State Orchidarium, which, in 1929, already received the public for visitation, with the aim of showing the richness of the regional flora.

Despite being open to public visitation since 1928, the São Paulo Botanic Garden was only made official in 1938, along with the creation of the Department of Botany of the São Paulo State Secretariat of Agriculture, Industry and Commerce. In 1942, the State Department of Botany gained autonomy and changed its name to Botanic Institute, having as its first director Dr. Frederico Carlos Hoehne, tasked with maintaining and managing the Botanic Garden, in addition to developing research across diverse areas of botany.

From there, construction began, within the JBSP grounds, of the buildings meant to host the State Botany Department. The construction of the buildings of the Dr. João Barbosa Rodrigues Botanic Museum, the Director's House, the Herbarium and of the Phytoteque. Except for the Botanic Museum, which remains in the same building, the other historic buildings currently are occupied by the Board of Directors of the JBSP, the Monitoring Nucleus, the Seed Research Nucleus, the Ornamental Plants Research Nucleus, the Nucleus for Conservation Education, and the Children's Nucleus.

The Botanic Garden has undergone few changes since 1956, when a new administration revitalized the public visitation area so as to provide better conditions for serving visitors, such as the installation of shelters and toilets along the visitation route. A master plan for the Botanic Garden, including landscaping and thematic collections, was requested of landscape designer Roberto Burle Marx. However, due to lack of resources, the contracted services were limited to the pre-plan, without details.

Starting in 1962, the public visitation area continued to change, with the most noteworthy among them including the creation of the Ipiranga Stream Source Lake; construction of the Small Castle (Castelinho); renovation of one of the greenhouses, in order to receive temporary exhibitions; construction of the Exhibition and Services Area; the construction of the reception area; installation of the parking lot outside the public visitation area; and reinstallation of the Historic Gate, next to the Hydrophytoterium.

From 1968 to 1971, in order to develop the Burle Marx blueprint, the leveling of the land, the delimitation of the lakes and the planting of grass were carried out in the front section of the garden, between gates 1 and 2. In order to achieve this, the garden had to close for two years.

In 1987, the Botanic Garden went through difficulties due to the lack of resources, and it deteriorated day by day, remaining closed between 1989 and 1992. In the 1990s, a process of revitalization of the São Paulo Botanic Garden was begun, and it reopened to public visitation in 1992.

During the first decade of 2000, the Botanic Garden underwent a few more transformations, carrying out construction work, maintenance and reforms. The Orchidarium was reopened for public visitation, in the same place where the State Orchidarium had functioned; the Exhibition and Services Area was reopened; the greenhouses were painted; and new species of plants were introduced within the collections.

In 2002, within the context of state programs for social inclusion, the Sensory Garden was

created as an adapted space for people with special needs and for the elderly, quickly becoming another attraction, used for educational purposes for schoolchildren.

Sensory Garden

The objectives of this garden are: to rescue the social function of people with special needs, as an element that transmits cultural memory, promoting their integration in the community; to promote the training of multiplying agents to work with special communities; and to awaken that community's interest in plants and environmental problems, raising awareness of issues related to the conservation and preservation of the environment, and encouraging them to exercise their citizenship.

Other significant construction projects were carried out in the garden, including the Spring Trail (Trilha da Nascente), inaugurated in 2006. Designed to minimize the impact of visitation on the remnants of the Atlantic Forest (the Biological Reserve of the Institute of Botany), the Spring Trail (Trilha da Nascente) is 360 meters long, with three areas of rest/contemplation/observation, and it is composed of a suspended walkway, built with reforestation wood and fully adapted to receive people with reduced mobility, such as elderly and wheelchair users. This trail provides the visitor's closest contact with the forest canopy, ending at the source of the Pirarungáua stream, one of the sources that form the historic Ipiranga Stream.

Spring Trail (Trilha da Nascente)

Another project worth mentioning is the 2008 revitalization of the Fernando Costa Lane. This historic lane, bordered by an alley of jerivá palms (Syagrus romanzoffiana), has presented different landscapes/faces since the establishment of the São Paulo Botanic Garden in the 1920s. In the 1980s, it was a grassy expanse and, in the 90s, it was paved with a floor of Portuguese mosaics. During the 2008 renovation, the natural landscape was restored by de-channeling the Pirarungáua stream. From there, the visitor follows an elevated walkway, adapted to allow accessibility for people with mobility limitations, about 250 meters long and built with reforestation wood, overlooking along its banks a landscape composed of native species, rescued from the construction work on the southern stretch of the Mario Covas Ring Road, some of which are threatened with extinction. This project complied with the principles established in the Management Plan of the State Park Ipiranga Springs, which provides guidelines for the recovery of water bodies.

Implementation of the walkway along the Pirarungáua stream

Landscaping with native species

Other interventions were carried out starting in 2008, such as the renovation of the JBSP entrance; the ecological pavement surrounding the entire extension of the institution; the renovation and expansion of the restaurant area; the renovation of the souvenir shop; and the creation of the Jequitibá Space for exhibitions; in addition to the expansion of public toilets and leisure areas (2010).

Starting in 2011, the greenhouse, which until then had been used for temporary exhibitions, underwent a renovation in order to receive a permanent exhibition about the Cerrado (the vast tropical savanna ecoregion covering more than 20% of Brazil's territory). It was named the Cerrado Greenhouse and was inaugurated in 2012. In this greenhouse, in addition to the characteristic plants of the biome, various interactive devices demonstrating some aspects of the structure and functioning of the different ecosystems of the Cerrado are exposed, showing the use of its resources and environmental services.

Dr. Frederico Carlos Hoehne Greenhouses, São Paulo Botanic Garden, in 2002

The heritage designation of several elements in the JBSP relates to its historical vocation as a “historic garden that is a testimony of a culture, of a style, of an era, possibly of the originality of a creator.” (Letter from Florence, 1981).

In 2017, the CONDEPHAAT - Council For The Defense Of Historical, Archaeological, Artistic And Tourist Heritage Of The State Of São Paulo, in its Ordinary Session of 06.16.2017 (D.O.E/Official Gazzette. of 06.10.2017), decided to list the State Park Ipiranga Springs as heritage. In 2019, the listing of the PEFI as “a cultural asset of historical, environmental, landscape and architectural interest” was made official through Resolution SC - 103 of 11.7.2018 (D.O.E./Official Gazzette of 11.10.2018). The JBSP complex, included in the list, consists of the following elements:

a) Von Martius Lane, the landscape project by Roberto Burle Marx;
b) The Lakes of the aforementioned Lane;
c) Headquarters of the Dr. João Barbosa Rodrigues Botanic Museum;
d) Greenhouses and visitor Orchidarium;
e) Garden of Linnaeus and stairs;
f) Historic access gate to the old water treatment plant;
g) Director's House building;
h) Ornamental Plants Building;
i) Environmental Education Building

The PEFI State Park’s vegetation cover, the headwaters of the Ipiranga Creek and the Foundation for Science and Technology (CIENTEC) Park Complex were also listed.

In 2019, the Municipal Council for the Preservation of the Historical, Cultural and Environmental Heritage of the City of São Paulo - CONPRESP, through Resolution Nº 40/ CONPRESP/2018 (published on 03.04.2019) also listed the buildings and the native vegetation of the State Park Ipiranga Springs, an area that includes the São Paulo botanic Garden and the CIENTEC Park, as cultural assets of artistic, urbanistic, landscape, historical and tourist interest in the city of São Paulo.

The “Dr. João Barbosa Rodrigues” Botanic Museum, conceived by Frederico Carlos Hoehne and inaugurated in 1942, was designed to be a didactic-exhibition space, which makes up the JBSP's visitor route. Its mission is to prepare exhibitions that address the historical, cultural and scientific importance of botanic science in Brazil, with an emphasis on the conservation of São Paulo and

Brazilian biodiversity, the sustainable use of natural resources and the maintenance of environmental services. Its original exhibition was formed by wall showcases, composed of 1,330 paintings, brought from the furniture collection of the Butantã Institute (the institution that housed the botanic collection of the state of São Paulo and that gave rise to the JBSP and IBt). These showcases displayed exsiccates of plants with high historical, cultural and scientific value, which portrayed São Paulo vegetation at the end of the 19th century and throughout the 20th century. This collection remained on display until 1992, when part of it was incorporated into the scientific collection of the “Maria Eneyda P. Kauffman Fidalgo” State Scientific Herbarium. In 1992, the long-term exhibition was then reformulated, and a didactic approach was adopted, highlighting plant parts and representative seeds of plants from the São Paulo, Atlantic Forest and Cerrado biomes. It received awards from IBRAM's "Program for Promoting Museums" (2012 and 2013 notice), which made it possible to carry out repairs to the building and to prepare a new exhibition, respectively. In 2017, CONDEPHAAT decreed the listing of the State Park Ipiranga Springs, including the building of the "Dr. João Barbosa Rodrigues" Botanic Museum, making it a duty of the Institute of Botany to preserve the historic property. In 2019/2020, restoration of the building's physical structure and the elaboration of a new exhibition were carried out with funding from the Environmental Compensation Chamber. All construction carried out since 2017 was authorized by CONDEPHAAT (Process 80683/2018).

2.2. STRATEGIC DOCUMENTATION FOR BOTANIC GARDENS

Over the years, Brazilian botanic gardens have improved the organization and consolidation of their mission.

For several years, a series of documents was prepared with the aim of supporting the creation and management of botanic gardens. The following are important international and national documents:

After ECO-92, the scientific community started to mobilize in the search for solutions to environmental problems. Among the relevant issues is the preservation of biodiversity, an area in which botanic gardens play a prominent role, whether in the scientific, technological, educational or cultural areas.

The Convention on Biological Diversity (CBD), approved during the 2nd United Nations Conference on Environment and Development, held in Rio de Janeiro in 1992, has as its objectives the conservation of biological diversity, the sustainable use of its components and the distribution of benefits derived from the use of genetic resources.

In 1997, with the enactment of Law Number 9509/97, which provides for the state's environmental policy, the botanic gardens of São Paulo State came under legal protection, considered as nature conservation units.

In 1999, the Darwin Technical Manual for Botanic Gardens, published by Botanic Gardens Conservation International (BGCI) and an important document that sets the guidelines for the development of Brazilian and foreign botanic gardens, was published, and, in 2001, the International Conservation Standards for Botanic Gardens was issued.

The National Council for the Environment (Conselho Nacional do Meio Ambiente - CONAMA), through Resolution 266, of August 3, 2000, defines a botanic garden as: “the protected area, constituted in whole or in part by collections of living plants scientifically recognized, organized, documented and identified, for the purpose of study, research and documentation of the country's floristic heritage, accessible to the public, in whole or in part, serving education, culture, leisure and conservation of the environment.”

It is also CONAMA that establishes, through Resolution 266, of August 3, 2000, the objectives of botanic gardens:

“I - promote research, conservation, preservation, environmental education and leisure compatible with the purpose of spreading the multicultural value of plants and their sustainable use;

II - protect, including through appropriate crop technology, wild, or rare, or endangered species, especially at the local and regional level, as well as safeguard species that are economically and ecologically important for the restoration or rehabilitation of ecosystems;

III - maintain ex situ germplasm banks and in situ genetic reserves;

IV - carry out, in a systematic and organized manner, plant records and documentation, referring to the plant collection, aiming at the full use for nature conservation and preservation, for scientific research and education;

V - promote scientific, technical and cultural exchange with national and foreign entities and bodies;

VI - stimulate and promote the human resource capacity-building.”

In 2003, CONAMA Resolution 339/2003 was published, considering the need to establish guidelines for the creation of botanic gardens, standardize operations and define objectives. For the purposes of this resolution, a botanic garden is understood as: the protected area, constituted in whole or in part, by collections of living plants that are scientifically recognized, organized, documented and identified, for the purpose of study, research and documentation of the heritage country, accessible to the public, in whole or in part, serving education, culture, leisure and conservation of the environment. This resolution establishes the National Botanic Gardens

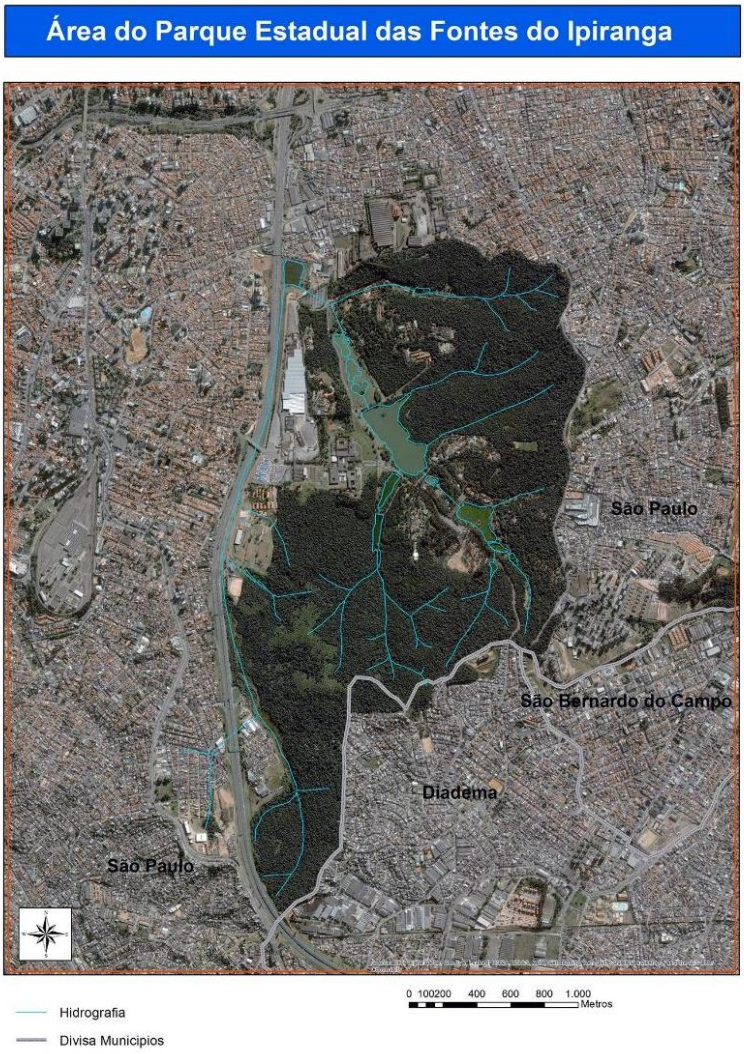
Commission (Comissão Nacional de Jardins Botânicos - CNJB), whose aim is to provide support to the Ministry of the Environment in the monitoring and analysis of matters related to botanic gardens, and it begins classifying Brazilian botanic gardens into categories, according to a series of criteria.

In 2004, the Action Plan for Botanic Gardens of the Brazilian Botanic Garden Network was published and, in 2006, the Global Strategy for the Conservation of Plants was issued.

2.3. SÃO PAULO BOTANIC GARDEN CLASSIFICATION

In 2010, the National Botanic Garden Commission (CNJB) granted the “São Paulo Botanic Garden” category “A”, in recognition of the services provided, following the criteria of CONAMA Resolution nº 339, of 09/25/2003. Among the items analyzed are scientific research projects in conservation, environmental education activities, the existence of herbarium and library, among others.

In the case of the State Park Ipiranga Springs, the highlight was the drafting of “Socio-Economic-Ecological and Legislative Studies for Characterization, Pre-Zoning and Strategic Planning, aiming at the Implementation of the Management Plan of the State Park Ipiranga Springs approved by the State Environmental Council - CONSEMA, in April 2008.



Area of the State Park Ipiranga Springs

3. MISSION

The mission of the São Paulo Botanic Garden is the "**preservation and sustainable use of biodiversity, through education and conservation in situ and ex-situ and knowledge of all groups of plants and fungi, as well as their relations with the environment, scientific, social and educational environment**."

Inflorescence of erythrine or suinã

4. OBJECTIVES OF THE SÃO PAULO BOTANIC GARDEN

- Organize the JBSP' physical space, establishing guidelines for land use;
- Establish priorities for physical space maintenance and conservation programs;
- Preserve and maintain the scientific, architectural, cultural and historical heritage;
- Conserve and expand the representative collection of native and exotic (non-invasive) flora, with a view to ex-situ conservation, research and education;
- Establish priorities for the introduction, replacement and conservation of garden species, promoting the maintenance of collections;
- Prepare a study based on maps and images, with the survey of species and their georeferencing;
- Carry out the management of invasive and undesirable regenerating species;
- Direct education and leisure activities aimed at social and cultural inclusion;
- Implement universal accessibility in visitors' spaces and collections;

- Maintain a germplasm bank and promote annual dissemination of the seed catalog (index seminum)
- Maintain an ex-situ germplasm bank with rare and endangered species as a means of biodiversity conservation;
- Maintain a program to interpret the biodiversity of the showcased flora;
- Maintain the environmental education program;
- Disseminate science and botany;

5. PERMITTED USES AND RESTRICTIONS

Visitor and public use activities in the Botanic Gardens must follow the current legislation, including regulations issued by the Institute of Botany, such as Directive IBT - 8, of 6/30/2016 (published on 7/1/2016) that regulates the activity of visitor and public use activities in the São Paulo Botanic Garden the capture of images for personal use, events and advertising locations.

In general, environmental education, contemplative leisure and scientific research activities are allowed, with the particularities of use and restriction described in the topics about each JBSP Landscape Unit.

6. PROPOSAL

For the effective purpose of this master plan and in compliance with the guidelines of the Master Plan and Proposal for Environmental Intervention in the land use and buildings in the visitor's area of the Botanic Garden of São Paulo, from 2007 to 2010 (Process SMA 20.249/07, at the suggestions presented in Rocha (1999) and the guidelines in the Darwin Technical Manual for Botanic Gardens (1999)), the division of JBSP areas into six “landscape units” was adopted, established by landscape criteria (presence and style of built and natural elements), historical (time of construction, style of architectural elements and historical relevance of geographical features), functional (intended uses) and the conservation and expansion of the collection of living plants that are representative of native and exotic flora, aiming at *ex-situ* conservation, research and education.

7. LANDSCAPE UNITS

7.1. Martius Unit

Key

Name of Unit

Martius

7.1.a) Overview

The Alameda Von Martius Lane was built after the officialization of the JBSP, in 1938. At the time, it was called, the "Avenue of the Palms" (“Avenida das Palmeiras”), with planted real palms alternating with pink *ipê* trees (Handroanthus impetiginosus (Mart. Ex DC.) Mattos), cv. dwarf) (Hoehne, 1941).

Opening of the Alameda Von Martius Lane, 1940s

Alameda von Martius Lane, 1950s

The Martius Unit refers to the area whose main axis is formed, on the one hand, by Avenue Miguel Stefano, making it the most visible landscape unit of the JBSP for the external public and, on the other hand, by Alameda von Martius Lane. Between these two routes there are three artificial lakes, which are part of the landscape design by Roberto Burle Marx. Due to its linearity, it can be called a “corridor” landscape unit and provides a perspective vanishing point.

Alameda von Martius Lane

Grassy area of the Martius Unit (January 2020) Photo: RT Shirasuna

It is characterized, on the side of the Miguel Stefano Avenue, by the presence of cherry blossoms (Prunus lannesiana cv. Yukiwari), interspersed with jerivás (Syagrus romanzoffiana (Cham.) Glassman).

The Alameda Von Martius Lane is formed by an alley of royal palms (Roystonea regia (Kunth) O. F. Cook), interspersed with pink *ipês* (Handroanthus heptaphyllus (Vell.) Mattos cv. Dwarf).

This unit is part of the collection of native and exotic palm trees, close to gates 1 and 2, as well as “groups” of ipê trees of different species, the presence of several other tree species and part of the bamboo collection.

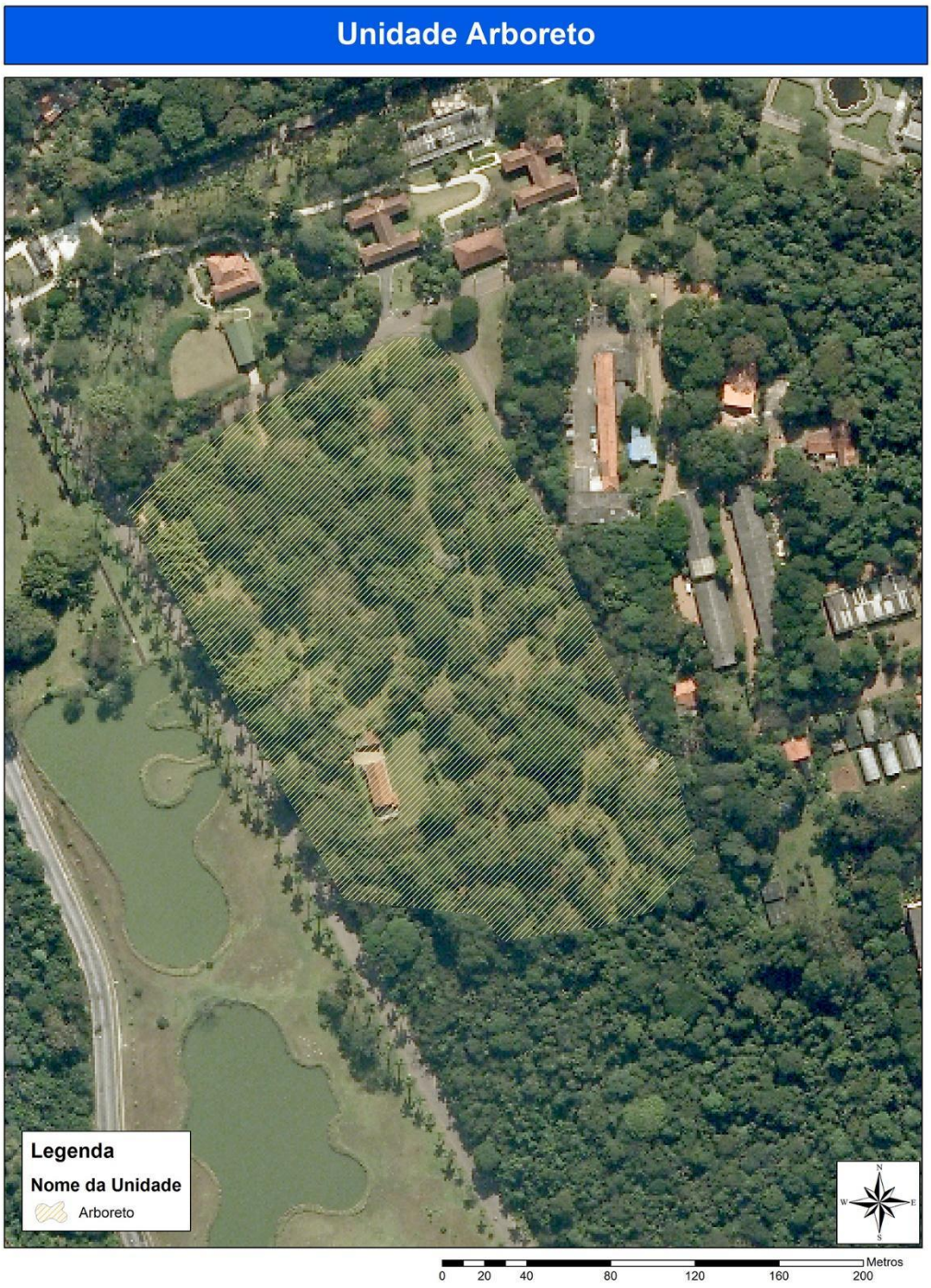
7.1.b) Permitted uses and restrictions:

In this unit, which was originally intended for the conservation of the collection of native and exotic palm trees, in addition to arboreal specimens, environmental education, contemplative leisure and scientific research activities are allowed. Due to its characteristics, it is also intended to hold events of a scientific, cultural and social nature (symposiums, weddings, orchestras, choirs), as long as they are in accordance with the existing rules in Directive IBT - 8, of 6/30/2016 (published on 7/1/2016), which regulates the activity of visitation and public use in the São Paulo Botanic Garden and the capturing of images for personal use, events and advertising locations.

- ✔ **7.1.c) Intervention proposals:**

- ✔ Manage, conserve and replace, whenever necessary, the specimens that make up the alley of royal palms, interspersed with pink ipês (Handroanthus heptaphyllus (Vell.) Mattos cv. Dwarf), and the jerivás interspersed with the cherry trees, arranged along the bank facing Miguel Stefano Avenue;
- ✔ Manage, conserve and replace the collection of native and exotic palm trees, giving priority to those native to the region and those listed as endangered;
- ✔ Manage the vegetation at the edge of the forest, close to the Alameda Von Martius Lane, preventing it from advancing into the alley of royal palms;
- ✔ Maintain natural vegetation and with *Cortadeira selloana* (Schult. & Schul f.) Asch & Graebn. (pampas grass) that borders the three lakes and functions as a breeding habitat for birds, always respecting the nesting periods of the birds, in addition to working on the maintenance of the slope, preventing erosion and landslide processes;
- ✔ Control exotic/invasive species such as hemiparasites and, especially, grasses (e.g., brachiaria and jaraguá grass);
- ✔ Promote native herbaceous species (grasses, Cyperaceae, Hypoxidaceae, etc.), as long as the unit's landscape function is appropriate;
- ✔ Maintain the countryside landscape throughout the unit, with constant management (removal or transplanting) of regenerants;
- ✔ Conserving the collection's bamboos and managing them so that the areas they already occupy remain “restricted.”
- ✔ Plant pampa grass (Cortaderia selloana (Schult. & Schul f.) Asch & Graebn.) at the lake's edge to replace the brachiaria, always respecting the birds' nesting periods;

7.2. Arboretum Unit



7.2.a) Overview

This space, called JBSP Arboretum, apparently was used by F. C. Hoehne as an area denominated “experimental field or nursery,” as described in the description and location of several species mentioned in Hoehne et al. (1941): "First the plants were grown in the Experimental Nursery,

and then they were implanted in the garden's visitors' area".

In the 1990s, this space was named Arboretum, due to the widely used definition:

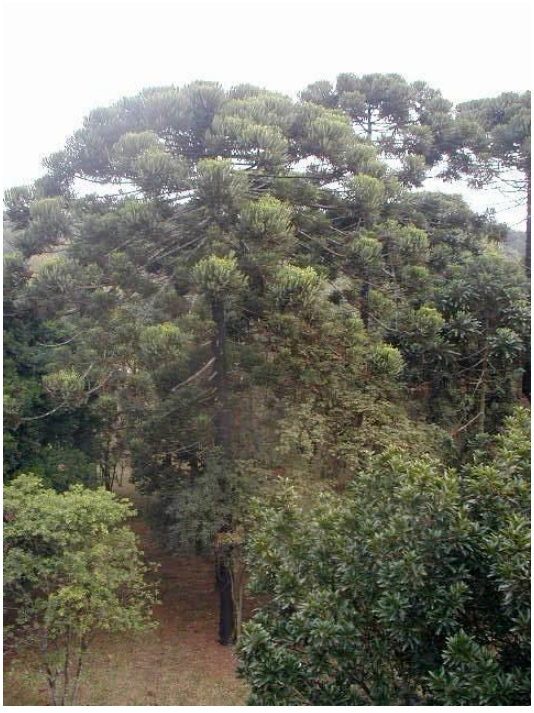
“... arboretum (in English, from Latin, arboretum in the singular, and arboreta in the plural) is a botanic garden or an area intended for the cultivation of a collection of trees, shrubs, herbaceous, medicinal, ornamental or other plants, scientifically maintained and organized, generally documented and identified, and open to the public for the purposes of recreation, education and research.” (http://pt.wikipedia.org/wiki/Arboreto).

The JBSP Arboretum features several specimens of tree and shrub species, palm trees and exotic and native conifers, with an emphasis on several specimens of paraná pine (Araucaria angustifolia (Bertol.) Kuntze), an endangered species. This collection also includes several examples of fruit plants and fine woods (Milanez, 1999).

There are also two buildings in this area: one house is used as an employee's residence, and the other for visitor toilets.

Finally, there is an area for contemplation, the “Tatiana Sendulsky Corner,” named after the internationally recognized researcher and specialist in grasses. Part of the bamboo collection is located on site.

Bordering the Arboretum and the Alameda Von Martius Lane, near the restrooms for visitors, there is a set of panels for temporary technical-scientific-cultural exhibitions.



Paraná pine (Araucaria angustifolia) in the Arboretum

Arboretum

Arboretum (January 2020) Foto: RT Shirasuna

7.2.b) Permitted uses and restrictions

- ✔ This unit is dedicated to activities of environmental education, contemplative leisure and scientific research.

7.2.c) Intervention proposals

- ✔ Carry out an inventory of the arboreal/shrub vegetation of the Botanic Garden, with taxonomic identification of existing species, marking individuals, marking georeferenced coordinates and organizing a database;
- ✔ The arboretum should preferably be composed of regional, rare and endangered species, and can support some exotic species, of interest, as long as they are not invasive;
- ✔ Manage, conserve and replace (with a sufficient number of specimens that ensure an adequate representation of the genetic diversity and maintenance of the species whenever necessary the collection of trees that make up the arboretum; carry out constant monitoring of the collection, control of pests and diseases;
- ✔ Perform maintenance and revitalization, whenever necessary, of “Tatiana Sendulsky Corner”;
- ✔ Conserve and replace bamboos in the collection and manage them constantly so that the areas they already occupy remain “restricted”;
- ✔ Perform constant management of regenerants;
- ✔ Perform brachiaria control (clearing);
- ✔ Remove the specimens of Pinus sp.
- ✔ Manage exotic/invasive species (eg windmill palm, sweet pittosporum, hemiparasites and plant parasites).

7.3. Fernando Costa Unit

7.3.a) Overview

This refers to the area whose main axis, called Fernando Costa Lane, is formed by the footpath that borders the Pirarungáua stream, from Entryway 1, located at Miguel Stefano Avenue,

number 3031, in the vicinity of the Dr. João Barbosa Rodrigues Botanic Museum. Due to this linearity, it can also be called the “corridor” landscape unit and provides a vanishing point of perspective.

Fernando Costa Lane is characterized by the presence of a jerivá palm alley (Syagrus romanzoffiana (Cham.) Glassman.), bordering the footbridge over the Pirarungáua stream, in its main axis, and by the presence of several tree specimens from the botanic collections, which are to the right of the unit, starting from Entrance Reception 1. On the left side, we have panels for temporary exhibitions of a technical-scientific-cultural nature, as well as the area previously occupied by the João Brumaruf site, which is set to be incorporated into the JBSP area once again.

There are several buildings in this unit: Entrance Reception 1; the Director's House, which houses the executive boards of the Botanic Garden and Reserves, and the Ecology and Physiology Research Center, as well as the Surveillance Nucleus, and the buildings that they house: the Seed Research Nucleus, the Ornamental Plants Research Nucleus, the Conservation Education and Research Nucleus and the Children's Center, in addition to the restaurant building, souvenir shop and restrooms.

Right behind the building of the Director's House, there is the Jequitibá Space, for events of different nature and exhibitions, such as Orchids and Bonsai, in addition to various events of the institution.

Next to the Jequitibá Space, there is part of the collection of plants of economic importance, basically fruit species, among other species.

In particular, this unit is currently widely used by the activities of the educational program of the Conservation Education Research Nucleus, and therefore, should be maintained for SMA-environmental education projects, as well as the other units.

Fernando Costa Lane

Detail of the Fernando Costa Lane, 1940s

Tree collection in the Fernando Costa Unit

(January 2020) Photo: RT Shirasuna

7.3.b) Permitted uses and restrictions

This unit is dedicated to activities of environmental education, contemplative leisure and scientific research. In addition to these, the Jequitibá Space and its surroundings are an area for small events of a scientific, educational, cultural and social nature, as long as they are of interest to the institution and are in accordance with the existing rules in the Directive IBT - 8, from 6/30/2016 (published on 7/1/2016), which regulates visitor and public use activities in the São Paulo Botanic

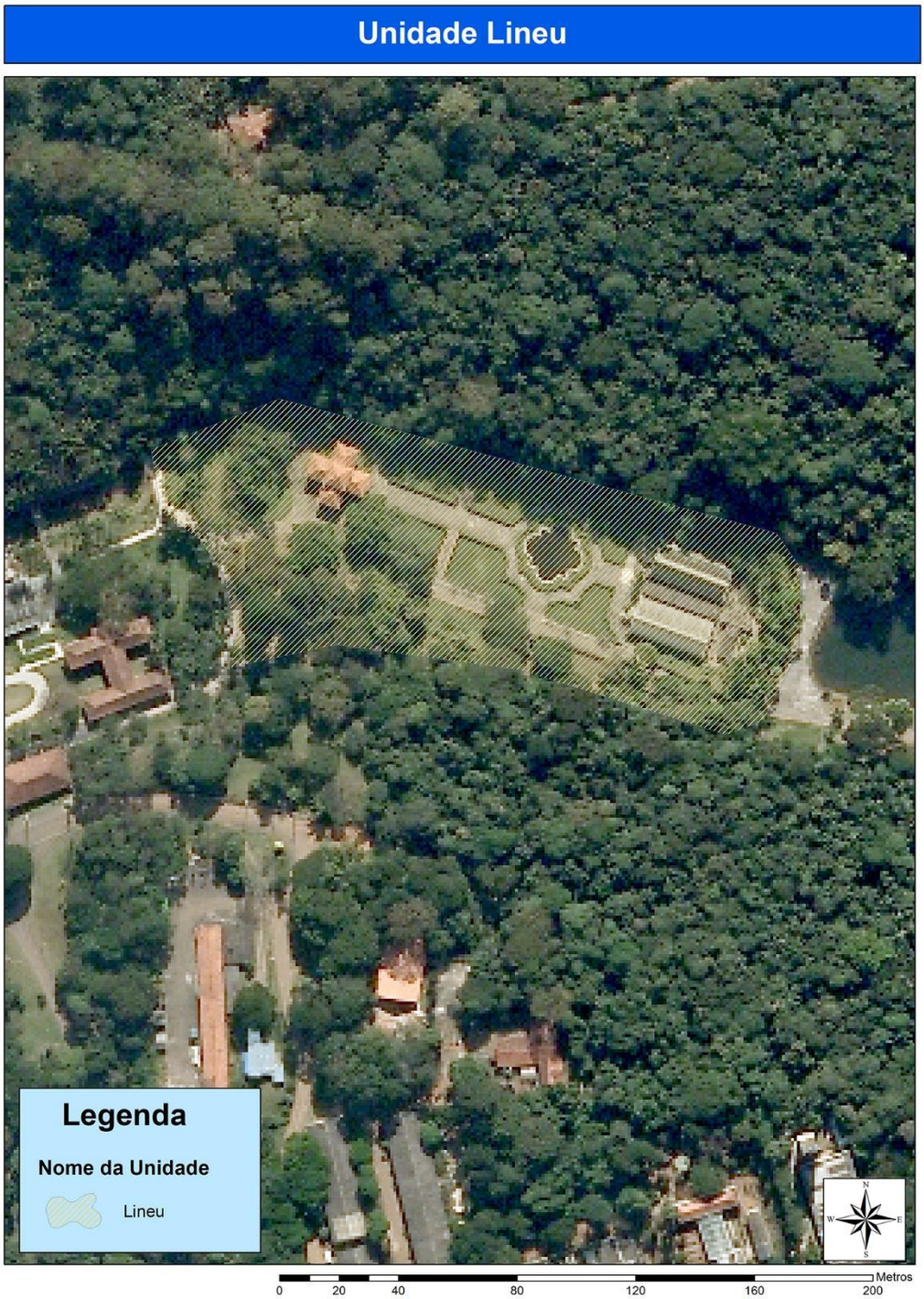
Garden and the capture of images for personal use, events and advertising leases.

Events of a social nature must take place outside of JBSP's visiting hours, respecting the calendar of traditional orchid and bonsai exhibitions.

7.3.c) Intervention proposals

- ✔ Periodically de-silt the Pirarungáua stream;
- ✔ Manage (remove exotic/invasive species), conserve and replace native aquatic vegetation and vegetation on the banks of the stream;
- ✔ Manage, conserve and replace, whenever necessary, the specimens of the Collections, giving preference to regional species, rare and threatened, including management in relation to pests and diseases;
- ✔ Manage, conserve and replace, whenever necessary, the specimens of the Gymnosperms Collection;
- ✔ Revitalize the Collection of Plants of Economic Importance, mainly of fruit species, which are located next to the Jequitibá Space, specifically relevant to environmental education;
- ✔ To implant a bed with typical species of the Cerrado between the building of the Seed Nucleus and the building of the Children's Center for visitor education and for Environmental Education activities;
- ✔ Carry out constant maintenance of the beds, with species diversification and inclusion of species that are attractive to visitors;
- ✔ Diversify species used for covering;
- ✔ Keep the grassy area mowed with removal/eradication of brachiaria and other invasive exotic grasses;
- ✔ Perform constant management of regenerants;
- ✔ Manage exotic/invasive species (eg fan palm, incense stick, hemiparasites and plant parasites, etc.);
- ✔ Remove hedge of dracaena plants located near the mansion
- ✔ Carry out maintenance of the elevated walkway over the stream;

7.4. Linnaeus Unit



Key

Name of the Unit

Linnaeus

7.4.a) Overview

It is located at the bottom of the Pirarungáua stream valley, constituting the oldest landscape unit of JBSP, since the garden was born there.

This unit is characterized by the presence of the “Dr. João Barbosa Rodrigues” Botanic Museum; the Garden of Linnaeus, formed by the pool, portals and staircases; Dr. Frederico Carlos Hoehne Greenhouses; the Dr. Frederico Carlos Hoehne Public Visiting Orchidarium; the Bromeliary; and the Historical Palm Alley.

DR. JOÃO BARBOSA RODRIGUES BOTANIC MUSEUM

The “Dr. João Barbosa Rodrigues” Botanic Museum, conceived by Frederico Carlos Hoehne and opened in 1942, was designed to be a didactic-exhibition space that is part of the JBSP's visitors route. Its mission is to prepare exhibitions that address the historical, cultural and scientific importance of botanic science in Brazil.

The Museum in the 40s

botanic Museum

Its exhibition is formed by parietal showcases, composed of 1,330 paintings brought over from the furniture collection of the Butantã Institute (the institution that housed the botanic collection of the state of São Paulo and that gave rise to the JBSP and the IBt).

GARDEN OF LINNAEUS, POOL AND STAIRS

This garden's landscape structure is commonly found among European gardens. Its construction was inspired by a part of the Botanic Garden of Uppsala, Sweden, more specifically the college garden where Carl Von Linnaeus--considered to be one of the greatest botanists of all time and the “father of taxonomy”, for having created the binomial system classification of living beings--worked.

The Garden of Linnaeus is adorned by boxwood (Buxus sempervirens L.), which--in keeping with European gardens--is maintained in topiary, and by suinã specimens (Erythrina speciosa Andr.).

Garden of Linnaeus

Garden of Linnaeus in the 1960s

DR. FREDERICO CARLOS HOEHNE GREENHOUSES

The Dr. Frederico Carlos Hoehne Greenhouses, built with an iron structure imported from England, keep exhibits of plants that are characteristic of the Cerrado and Atlantic Forest Biomes.

In the Cerrado Greenhouse, in addition to the characteristic plants of the biome, various interactive devices are displayed that demonstrate some aspects of the structure and functioning of the different ecosystems of the cerrado and also show the use of its resources and environmental services.

The Atlantic Forest Greenhouse simulates the light, temperature and relative humidity conditions of the natural environment that supports plants such as orchids, bromeliads, marantaceae, philodendrons, anthuriums, begonias, and palm trees, among others, many of which are at risk of extinction. This greenhouse has an irrigation system that draws on the waters of the Pirarungáua stream, which have been dammed in the garden's ponds.

Dr. Frederico Carlos Hoehne Greenhouses

DR. FREDERICO CARLOS HOEHNE VISITOR ORCHIDARY AND BROMELIARY

The visitor Orchidarium, located since its construction among the greenhouses, is the embryo of the São Paulo Botanic Garden and displays orchid specimens. Behind the greenhouses are specimens of bromeliads and cacti.

Visitation orchidary

HISTORICAL PALM ALLEY

Just behind the greenhouses, there is a small collection of palm trees, the Historical Palm Alley, implanted in 1933 by Dr. Frederico Carlos Hoehne to show the visiting public of the JBSP the beauty, usefulness and scientific importance of native and exotic palm trees. Among the species present, the jerivá (Syagrus romanzoffiana (Chamb.) Glassm.); the juçara palmetto (Euterpes edulis Mart.); the Chinese fan palm (Livistonia chinensis (Jacq.) R. Br. ex Mart.); and the fishtail palm (Cariota mitis L.).

Implantation of the palm alley in the 1940s

Historical Palmeto (January 2020) Photo: RT Shirasuna

7.4.b) Permitted uses and restrictions

This unit is dedicated to activities of environmental education, contemplative leisure and scientific research.

7.4.c) Intervention Proposals

- ✔ Conserve and revitalize, whenever necessary, the exhibition of the Cerrado Greenhouse, the Atlantic Forest and the Botanic Museum;
- ✔ Conserve, manage and add native species to the Atlantic Forest Greenhouse; Replace the exotic species introduced by species typical of the Atlantic Forest;
- ✔ Conserve, manage and increase the native species of the Public Visitor Orchidary and Bromeliary;
- ✔ Conserve, manage and replace specimens of Historical Palm Alley (Hoehne 1933 native and exotic);
- ✔ Develop and implement a slope containment project, on the left side of the Garden of Linnaeus and beside the Botanic Museum;
- ✔ Manage the surrounding forest, on the left side of Garden of Linnaeus, preventing it from advancing over the Garden;
- ✔ Keep the grassy area mowed with removal/eradication of brachiaria and other invasive exotic grasses;
- ✔ Perform constant management of regenerants;
- ✔ Manage exotic species (eg fan palm, sweet Pittosporum, hemiparasites and plant parasites);
- ✔ Maintain the height of the small bushes between 40 and 50 cm in the Garden of Linnaeus;
- ✔ Substitute erythrina with a species that is better suited to the unit's environmental conditions;
- ✔ Implant a bed with typical species of the Cerrado between the building of the Seed Nucleus and the building of the Children's Center to educate visitors and use for Environmental Education activities;
- ✔ Restoration, when necessary, of greenhouse structures;

7.5. Nymphaea Unit

KEY

Unit

Nymphaea **Municipality of São Paulo, Datum: Sirgas 2000, Projection: UTM, Time**

Zone: 23 S, Date 17/11/2015

Drawn up by: Paulo Roberto R. Ortiz

7.5.a) Overview:

This unit is characterized by the existence of lakes formed by the springs of the Ipiranga Spring and by being the largest disposal area for the specimens of the botanic collection. For this reason, it can be considered a “spot” landscape unit.

There are several attractions in this area in addition to the specimens of the botanic collection. With regard to buildings, there are two toilets: one in the vicinity of Nympheas Lake and the other next to the Castelinho (Small Castle).

Among the attractions of this unit, the following stand out:

NYMPHEAS LAKE

Nympheas Lake was formed by the damming of streams that feed the Ipiranga Stream, carried out between 1929 and 1930. This lake serves as a place for maintaining aquatic macrophyte species, in addition to several species of unicellular algae.

The streets around the lake were paved in 1939. The street on the right side of the lake is called Barbosa Rodrigues path and the one on the left, Prof. R. Schlechter (Hoehne, 1940).

Nympheas Lake

IMBUIA FOREST

The forest is formed by several specimens of this species (Ocotea porosa (Nees) L. Barroso), which is threatened.

Imbuia Forest (January 2020) Photo: RT Shirasuna

HIDROPHYTOTERIUM

The Hidrophytoterium, completed in 1947, was designed to house specimens of aquatic plants, both floating and fixed.

It houses plants of various species, in addition to several microscopic algae, all suitable for research and didactic demonstrations.

Hydrophytoterium Photo: RT Shirasuna

HISTORIC GATE

The Historic Gate was located at the entrance to the old Public-managed Water Unit, which operated in the Botanic Gardens until 1928. Today, it merely ornaments the Nymphaea Unit. At the front of this gate there is the Hydrophytoterium, while at the back there is the Howler Monkey Lake

(Lago dos Bugios) and its spillway.

Historic Gate

FOREST OF FERNS AND PTERIDOPHYTA (BOSQUE DOS SAMAMBAIAÇUS E XAXINS)

Located next to the Hidrophyterium, in theImbúia Forest, it has specimens of xaxins (Dicksonia sellowiana Hook.) and giant ferns (Cyathea delgadii Sternb.), which, due to their beauty, stand out among the plants in this place.

HOWLER MONKEY LAKE (LAGO DOS BUGIOS)

Located behind the Historic Gate, it is a contemplative nook whose name alludes to the groups of howler monkeys that live in the Biological Reserve of the Institute of Botany.

Howler Monkey Lake (January 2020) Photo: RT Shirasuna

GARDEN OF THE SENSES (JARDIM DOS SENTIDOS)

The Garden of the Senses (Jardim dos Sentidos) opened in 2003 and houses a small part of the aromatic plants, with leaves of different textures, flowers of different colors and a water source to sharpen the senses of children and adults.

This space was also designed to provide a more meaningful experience for people with special needs, such as wheelchair users, the visually impaired and the hearing impaired. The Garden of the Senses was implanted in the area of the Japanese Garden, which had lost its original character.

Student tutoring program

PASSUARÉ FOREST (BOSQUE DOS PASSUARÉS)

At the bottom of an extensive lawn, surrounding the woods, there is a forest that is formed by some specimens of passuarés (Sclerolobium denudatum Vog.) It is an area widely used for picnics. There are two colonial-style benches with Portuguese tiles and a table on this site.

Detail of the picnic area in the Passuaré Forest, highlighting the table and one of the colonial-style benches

Bosque dos Passuarés (janeiro 2020) Foto: RT Shirasuna

NATURAL BOG (BREJO NATURAL)

In this landscape unit, there is an area of soaked soil where a natural bog occurs, showing plants characteristic of this type of vegetation.

Brejo Foto: RT Shirasuna

GUARICANGA FOREST (**BOSQUE DAS GUARICANGAS)**

This forest, which is located next to the Bamboo Tunnel (Túnel de Bambus), on the alternative path that leads to the castle, is represented by palm trees popularly called guaricangas and guaricangas-de bengala (Geonoma schottiana Mart.; Geonoma elegans Mart. And Geonoma gamiova Barb. Rodr.), which are native to the Atlantic Forest. It is also a widely used picnic area.

OBELISK, LAKE OF THE SPRINGS, BRIDGE AND WATER WHEEL (OBELISCO, LAGO DAS NASCENTES, PONTE E RODA D'ÁGUA)

The Obelisk marks the Spring Lake (Lago das Nascentes), formed by the damming of some springs of the Ipiranga Creek (Riacho do Ipiranga), and it features a wooden bridge and the Water Wheel.

Obelisk (January 2020) Photo: RT Shirasuna

THE HAMMER WATER WHEEL (MONJOLO)

The water-powered hammer wheel is located next to the Brazil Wood Forest (Bosque do Pau-Brasil).

The Hammer Water Wheel (Monjolo) Photo: RT Shirasuna

MOYSÉS KUHLMAN CORNER (RECANTO MOYSÉS KUHLMAN)

Space located next to the bottom of the Bamboo Tunnel, created in 1972 to honor the first director of the São Paulo Botanic Garden, Moysés Kuhlman.

BRAZIL WOOD FOREST (BOSQUE DO PAU-BRASIL)

Implanted in 1979, this forest consists mainly of specimens of Brazilwood (Caesalpinia echinata Lam.), meant to preserve and publicize this rare species, currently in danger of extinction. There are several other tree species in this area.

Inauguration of the Brazil Wood Forest, 1969

Brazil Wood Forest (January 2020) Photo: RT Shirasuna

BAMBOO TUNNEL (TÚNEL DE BAMBU)

Place where the bamboos, planted on the banks of the lane, come together to form a tunnel.

Bamboo Tunnel

SMALL CASTLE (CASTELINHO)

The Small Castle (Castelinho) is a building built with a wattle and daub house, intended for children's recreation and located near the Spring Trail (Trilha da Nascente). In front of the building there is a picnic area with various equipment such as benches, tables, shelter and a drinking fountain.

Small Castle

LOOKOUT (MIRANTE)

The Lookout is located next to the top of the Bamboo Tunnel. However, it no longer fulfills its function, since the regenerating vegetation and specimens of the Brazil Wood Forest prevent a broader field of vision, thus making a more panoramic view of this unit impossible.

The Lookout in the 1960s

Current view from the Lookout Photo: RT Shirasuna

SPRING TRAIL (TRILHA DA NASCENTE)

The Spring Trail (Trilha da Nascente), inaugurated in 2006, was built with reforestation wood and designed not to impact the Atlantic Forest. The Spring Trail (Trilha da Nascente) is fixed, suspended, 360 meters long and has three observation areas, which are adapted to receive people

with reduced mobility, such as the elderly and wheelchair users. This trail gives visitors the opportunity to reach the source of the Pirarungáua Creek, one of the sources that form the Ipiranga Creek, and to observe animals that live in the State Park Ipiranga Springs, such as the howler monkey, the sloth and many birds.

Environmental education, visitation and contemplation and scientific research activities are allowed on this trail.

Spring Trail

DIRT TRACK (CAMINHO DE TERRA BATIDA)

This dirt track is allowed for public visitation. It starts on the staircase, on the right side of the Garden of Linnaeus, and reaches the Small Castle.

7.5.b) Permitted uses and restrictions

This unit is dedicated to activities of environmental education, contemplative leisure and scientific research.

7.5.c) Intervention proposals:

- ✔ Elaborate an executive project to install the Braille signs on the exposed plants;
- ✔ Manage, conserve and replace specimens (Geonoma schottiana Mart.; Geonoma elegans Mart. and Geonoma gamiova Barb. Rodr.), whenever necessary, the Guaricanga Forest;

- ✔ Manage, conserve and replace specimens, whenever necessary, in the Xaxins Forest (Dicksonia sellowiana Hook.), ferns (Cyathea spp.) or tree ferns;
- ✔ Recover the area of Passuaré Forest (introducing new individuals from Passuaré);
- ✔ Manage, preserve and replace specimens, whenever necessary, in the Imbuia Forest, behind the Hydrophytoterium;
- ✔ Carry out a survey and assessment of vegetation removal; prepare reports and technical opinions to assess the possibility of managing the Brazil Wood Forest in order to restore the view of the lookout (possibly relocating individual specimens to the Fernando Costa Unit, close to Entrance Reception 1);
- ✔ Manage the bamboo so as to maintain the bamboo tunnel;
- ✔ Remove the base of the peace and freedom sculptures;
- ✔ Develop a project for the restoration of the set (table and benches with Portuguese tiles in colonial style) located in the Passuaré Forest;
- ✔ Restore the obelisk of the historic landmark of the springs;
- ✔ Carry out, whenever necessary, maintenance of the hammer water wheel;
- ✔ Carry out, whenever necessary, maintenance of the Little Castle and the Lookout;

Hydrophytoterium and Historic Gate

- ✔ Manage, whenever necessary, the **Hydrophytoterium** lake, including: cleaning, control of macrophyte biomass and de-silting (with prior consultation with the ecology nucleus board);
- ✔ Perform, whenever necessary, the recovery, maintenance and cleaning of the Hydrophytoidium cells;
- ✔ Enrich the **Hydrophytoterium** with native/exotic hydrophyte species;
- ✔ Manage and replace the aquatic plants of the **Hydrophytoterium**;
- ✔ Enrich with native species from the swampy area in front of the Historic Gate;
- ✔ Perform constant management of exotic/invasive swamp and canal in front of the historic gate and control of leaf-cutting ants, pests, and diseases;
- ✔ Perform the revitalization of the hydraulic structures that maintain the flooded area (broken and clogged pipes, the area is often dry and has been colonized by land invasive species);
- ✔ Restore the Historic Gate;

Garden of the Senses (Jardim dos Sentidos)

- ✔ Manage, conserve and expand the collection of plants from Garden of the Senses with aromatic species of different textures and colors;

- ✔ Perform constant management of invasive alien species;

Nympheas Lake (Lago das Ninfeias)

- ✔ Monitor the collection of plants at Nympheas Lake, maintaining its biodiversity;
- ✔ Remove material that emerges in the form of islands due to the silting process;
- ✔ Control the spread of invasive species along the banks;
- ✔ Control aquatic and exotic/invasive species close to the bridge, avoid establishing competition with water lilies;
- ✔ Maintain marginal vegetation that is important for its associated fauna;

Natural Bog (Brejo Natural)

- ✔ Prepare and implement a project to revitalize the Natural Bog, which has lost its character.
- ✔ Manage, conserve and replace specimens, whenever necessary, in the Natural Bog;

Howler Monkey Late (Lago dos Bugios)

- ✔ Revitalize the place;
- ✔ Perform maintenance of the lake guardrail;

Suspended Trail (Trilha Suspensa)

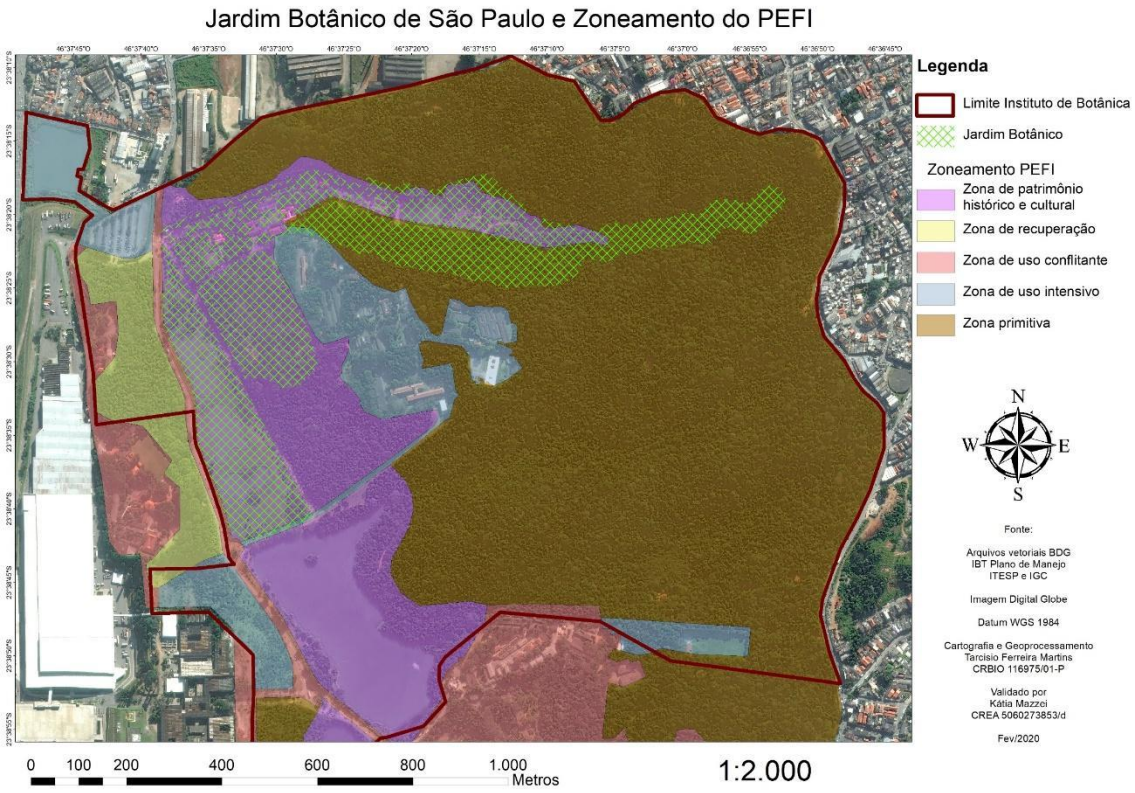
- ✔ Perform maintenance, whenever necessary, of the suspended trail, paying attention to safety standards;

Trails and Dirt Track (Trilhas e Caminho de terra batida)

- ✔ Perform maintenance of trails and dirt tracks;

7.6. Hoehne Unit

São Paulo Botanic Garden and State Park Ipiranga Springs Zoning



Key

Boundary of the Institute of Botany

Botanic Garden

State Park Ipiranga Springs Zoning

Historical and cultural heritage zone

Recovery zone

Conflicting use zone

Intensive use zone

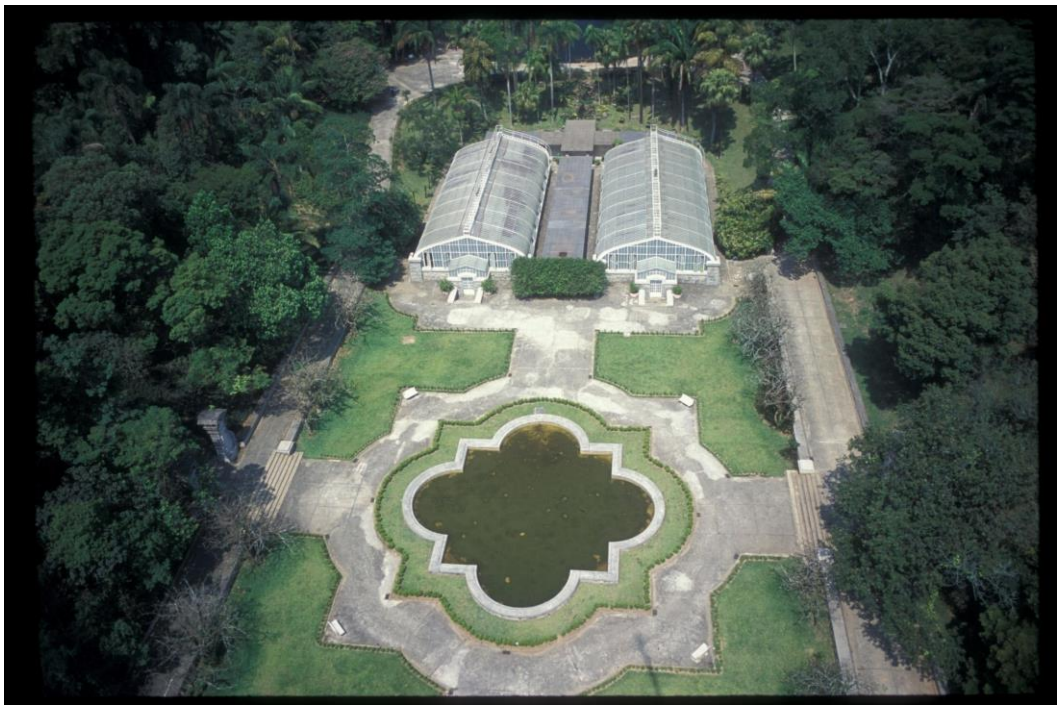
Primitive zone

7.6.a) Overview

This unit received this name as a homage to the founder of the JBSP, characterized by being the “core” landscape unit of the set of units proposed here. It is in contact with all other landscape units, in addition to having historical value for housing the Ipiranga Stream springs.

It is formed by native vegetation that has been conserved in the area since its expropriation in 1893, and is characterized as a Dense Ombrophilous Forest, with elements of Seasonal Semideciduous Forest, and constitutes a collection of these formations, conserved in situ at the JBSP.

All stretches of the primitive zone, classified in the PEFI State Park management plan and related to the border stretch, are covered.



Aerial view of the JBSP, highlighting the Garden of Linnaeus and Greenhouses

7.6.b) Permitted uses and restrictions

- ✔ This unit is not open to public visitation, as it is an area for scientific research.
- ✔ Management activities in forested and landscaped areas, management for restoration and/ or reconversion and conservation of the built heritage, respecting the original project, public use including educational activities, recreation, *ex-situ* collections, scientific research, and heritage monitoring.

Primitive zone:

- ✔ Scientific research, management and inspection activities. Public use only for environmental education, with little capacity for visitation. The existing trails only for monitored educational activities (with small groups) and non-predatory research.

7.6.c) Proposed interventions:

- ✔ Management of exotic species (eg Chinese fan palm, sweet Pittosporum, hemiparasites and plant parasites).

8 - COLLECTION OF TREE SPECIES

8.1. Historic

The idea of organizing, in a preserved area, in 1928, a Botanic Garden for the city of São Paulo, was intended to provide a recreation area for the population and to establish the preservation, production and exhibition of plants of the regional and national native flora.

At that time, the plants were cultivated at the Experimental Nursery, to be later implanted in the visiting area of the Botanic Garden.

The species had identification plates and, in order to facilitate public learning, in 1941 the guide “The São Paulo Botanic Garden” was published, featuring the first 700 species to be implanted in the São Paulo Botanic Garden.

Over the following years, several working groups were formed at the institution, with the aim of continuing the work of species implantation, registration, taxonomic identification and species plaques.

Since then, the JBSP has been expanding its collection and updating its lines of action to meet the advances in national and international preservation policies associated with botanic gardens, especially the guidelines contained in the Darwin Technical Manual for Botanic Gardens.

By definition, a botanic garden should house “collections of living plants scientifically recognized, organized, documented and identified, for the purpose of study, research and documentation of the country's floristic heritage, accessible to the public, in whole or in part, serving education, culture, leisure and conservation of the environment” (CONAMA Resolution No. 266, of August 3, 2000).

8.2. The collection of tree species

The collection of tree species, located in the visitation area of the JBSP, is present in five of the six landscape units, forming a landscape set suitable for the architectural installations of the garden. The trees are isolated or in forests, lanes, corners and also in Palm Alley and Arboretum.

It stands out for its historical and conservationist importance, and it aims to preserve and conserve native species, mainly from the Atlantic Forest, exotic, rare and endangered species, according to lists published by state, federal, international agencies, or specialized non-governmental organizations.

Particularly noteworthy are the collections of native and exotic palm trees, species threatened with extinction, those of noble Brazilian woods, native fruit, and exotic species.

Among the most representative species, we have the collection of native and exotic palm trees. Frederico Carlos Hoehne came up with the idea of implanting a collection of palm trees in the São Paulo Botanic Garden. As far back as 1933, he carried out exchanges with similar institutions, which explains the considerable number of palm trees in the Botanic Garden, especially behind the greenhouses, in Palm Alley, and in other places in the garden.

... ”We have introduced many palm trees so that Pindorama, the land of palm trees, also presents itself in this Araucarilândia [the land of the Araucaria trees]” ... according to Hoehne.

Another important collection is that of tree species threatened with extinction. To meet the conservation and preservation requirements of species threatened with extinction and achieve the goal of the Brazilian Botanic Garden Action Plan for conservation and preservation, over the years the São Paulo Botanic Garden has been carrying out important conservation work of these species, with species that are constantly present in the State list of endangered species from SMA and IBAMA.

Palmeira leque-chinês (Windmall palm)

8.3. Registration and Mapping

- ✔ The collection is documented in an electronic register, with sequential numbering in ascending order, under the acronym JBSP, and also through catalogs, or registry book. The collection areas in the field are mapped and georeferenced, as an integral part of their management.

8.4. Proposals for Interventions

- ✔ Define the collections and the profile of each one;
- ✔ Carry out an inventory of the arboreal/shrub vegetation of the Botanic Garden, with taxonomic identification of existing species, marking of individuals (plaques), georeferencing and the organization of a database.
- ✔ Restore and expand the collection with species of native and exotic flora, aiming at *ex-situ* conservation, research and education;
- ✔ Carry out constant monitoring for the conservation of collections and management, whenever necessary, including replacement of specimens and control of pests and diseases;
- ✔ Manage exotic/invasive species;
- ✔ Make the collection data available on the institution's homepage.

Ipê-róseo *(Handroanthus heptaphyllus)*

9. INFORMAÇÕES CARTOGRÁFICAS PARA A ATUALIZAÇÃO

The JBSP's landscape units have been mapped over the years based on descriptions of

historical documents and various types of remote sensing such as satellite images, aerial photographs, and orthophotos, among others.

Maps are representations of reality; updates incorporate technological advances and allow for more accurate approaches. The Hoehenne landscape unit was insufficiently represented in the late 2000s, due to the scale of the images at the time and the reproduction of maps on A4 size paper.

The Dirt Track and the Spring Trail (suspended trail) belong to the Nymphea Unit, but their surrounding area belongs to the Hoehenne Unit. These features will be presented in digital maps in a detailed scale and will be made available on the homepage of the Institute of Botany.

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The Plan, approved at the meeting of the Technical Council of the Institute of Botany on 02/27/2020, can be reviewed at any time by the management group upon justified motivation or every three years.