



# Nature-based Solutions In Brazil

**Cecilia P. Herzog**

*Transforming Cities, Enhancing Well-being: innovating with nature-based solutions*

**EU-BRAZIL SECTOR DIALOGUE ON NBS**

**Corunã, May 16th , 2018**



European Union

MINISTRY OF  
SCIENCE, TECHNOLOGY,  
INNOVATION AND COMMUNICATIONS



EUROPEAN UNION  
BRAZIL

UNIÃO EUROPEIA - BRASIL

# Case Studies in Brazil



# Case Studies in Brazil

- ✓ **Campinas**, State of São Paulo
- ✓ **São Paulo**
- ✓ **Rio de Janeiro**



# Scales

Metropolitan



Local



# NbS Initiatives

- ✓ **Top-down: Public**
- ✓ **Bottom-up: Green grassroots movements**
- ✓ **Institutional: Environmental Compensation**

**Campinas**

# **Top-Down Plans and Policies**

**Municipal Green Plan to offer multiple  
social-ecological functions**



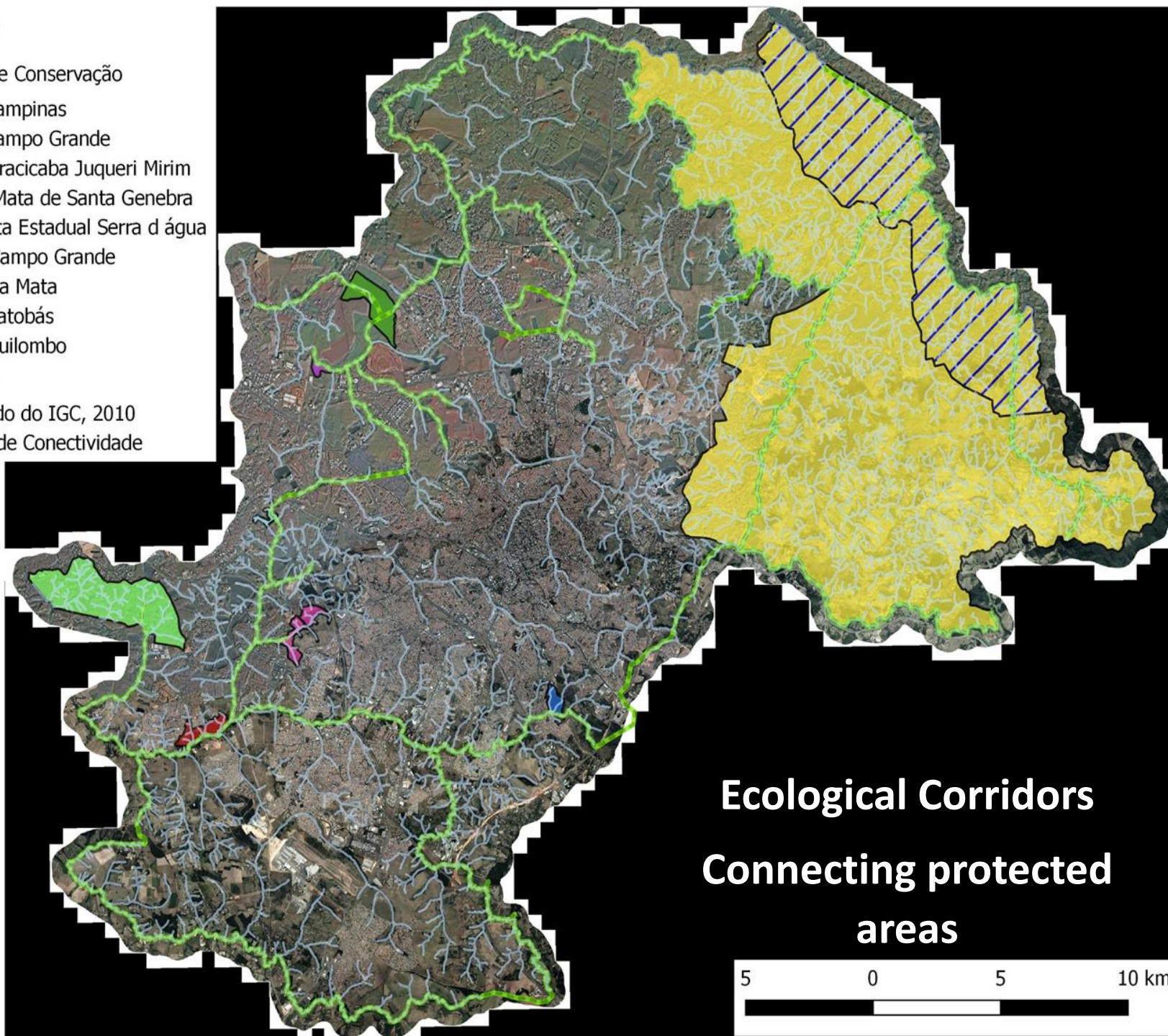
# Legenda

## Unidades de Conservação

- APA Campinas
- APA Campo Grande
- APA Piracicaba Juqueri Mirim
- ARIE Mata de Santa Genebra
- Floresta Estadual Serra d'água
- PNM Campo Grande
- PNM da Mata
- PNM Jatobás
- RVS Quilombo

## Hidrografia

- Alterado do IGC, 2010
- Linha de Conectividade



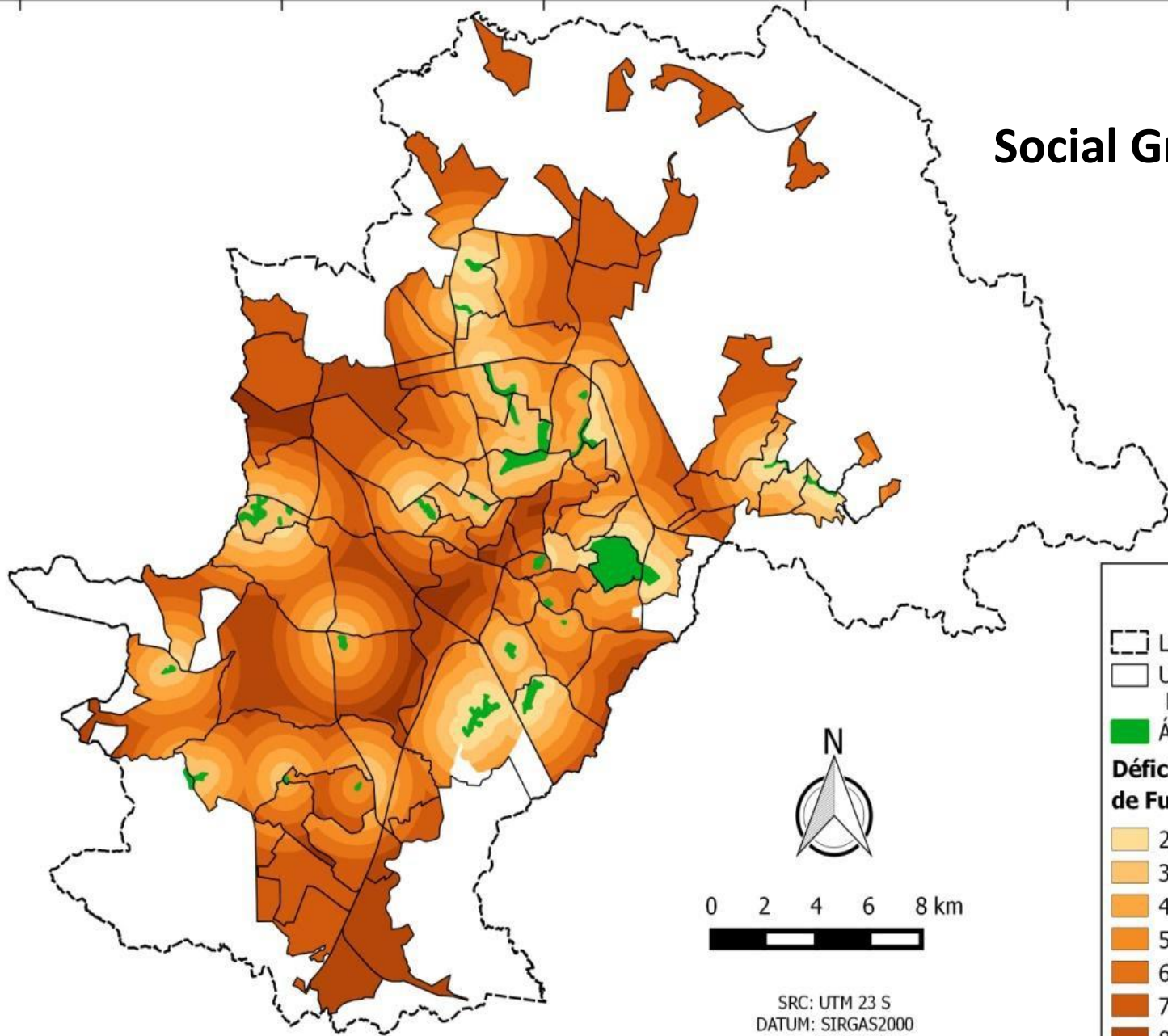
**Ecological Corridors  
Connecting protected  
areas**

5 0 5 10 km





# Social Green Areas



**Legenda**

- Limite Municipal
- Unidades Territoriais Básicas - UTB
- Áreas Verdes Sociais

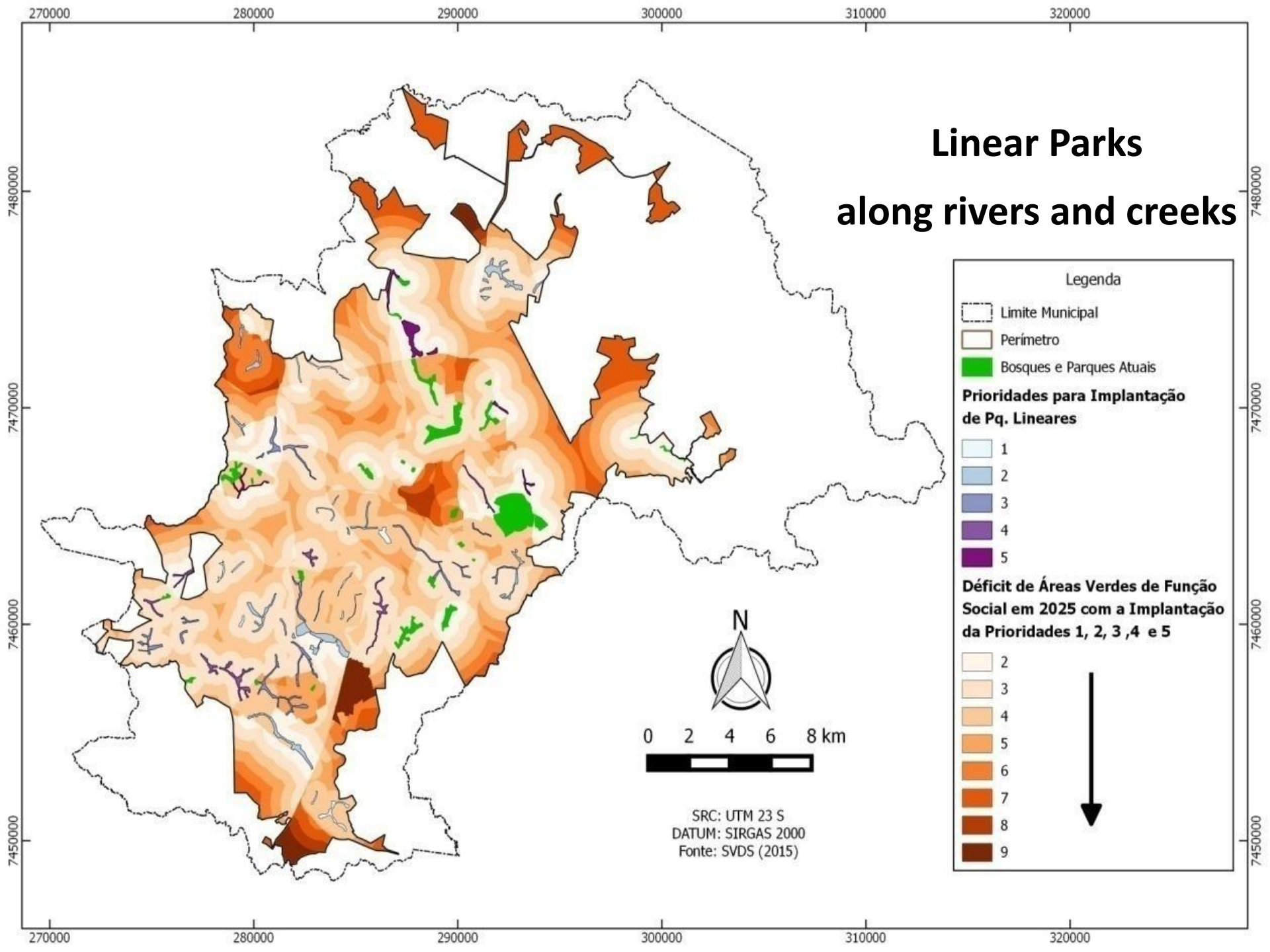
**Déficit de Áreas Verdes de Função Social**

2
3
4
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6
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9

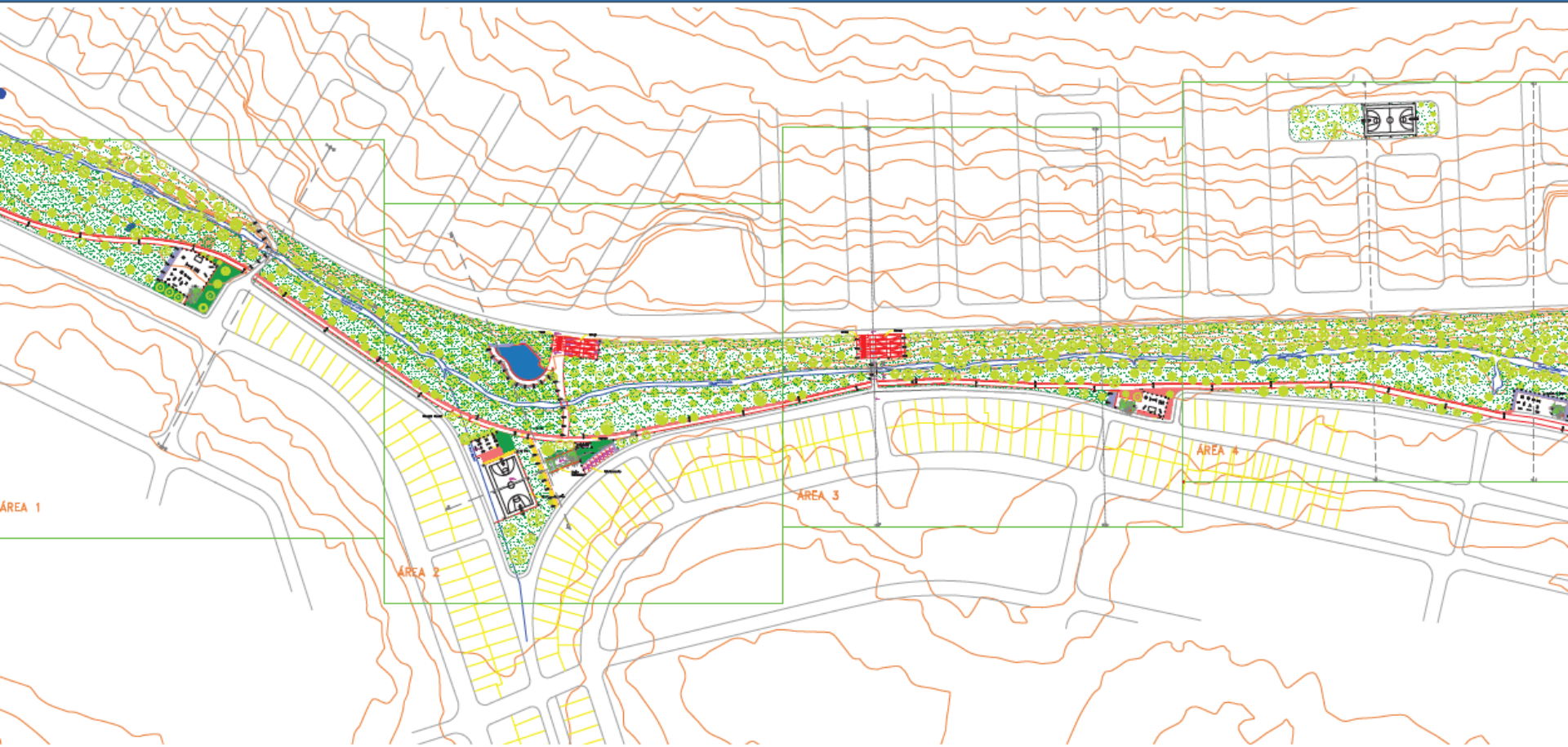
↓

SRC: UTM 23 S  
DATUM: SIRGAS2000  
Fonte: SVDS (2015)

# Linear Parks along rivers and creeks



# Lagoa Creek Linear Park











# Rural Areas

## Sewage Discharge Ecological Treatment

### Programa Saneamento Rural Sustentável

#### 1ª Oficina de Instalação e Operação de Fossas Sépticas Biodigestoras - FSB e Práticas Sustentáveis

Realização: Prefeitura Municipal de Campinas, através do Secretário da Verde, Meio Ambiente e Desenvolvimento Sustentável - SVDS

#### Programação

14:30 - Apresentação do Programa Saneamento Rural Sustentável  
Engº. Geraldo Andrade - SVDS

14:35 - Fossa Séptica Biodigestora: tecnologia social para tratamento de esgoto doméstico em propriedades rurais

Engº. Carlos Renato Marmo - Supervisor do Setor de Implementação de Transferência de Tecnologia da Embrapa Instrumentação, São Carlos (SP)

14:50 - Boas Práticas Sustentáveis - Aplicação no solo do biofertilizante gerado na Fossa Séptica Biodigestora

Bióloga Isabel Figueiredo - Doutoranda da FEC/UNICAMP

15:00 - Montagem de Unidade Piloto da Fossa Séptica Biodigestora com os participantes

Luis Aparecido de Godoy - Setor de Gestão de Campos Experimentais da Embrapa Instrumentação, São Carlos (SP)

**Dia:** 30/06/2017

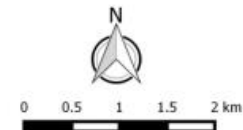
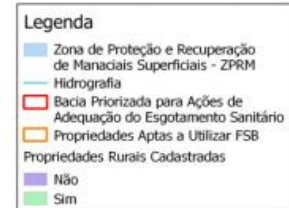
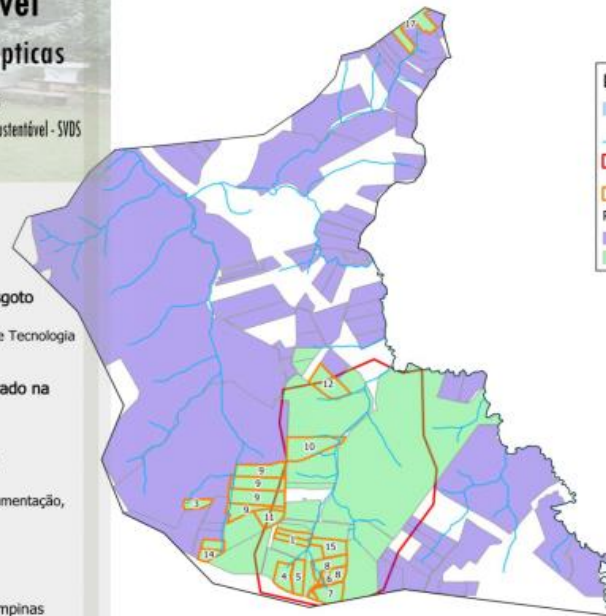
**Horário:** 14:30 às 17:30 horas

**Local:** Sítio São José - Igreja Nossa Senhora de Fátima (Cogo), Descampado - Campinas

**Contato:** Coordenadoria de Planejamento e Gestão Ambiental - CPGA/SVDS (19) 2116-8487

**Email:** geraldo.neto@campinas.sp.gov.br

#### Apoios





# Rural Areas Payment for Environmental



1ª Etapa – 29/06/17

2ª Etapa – 30/06/17

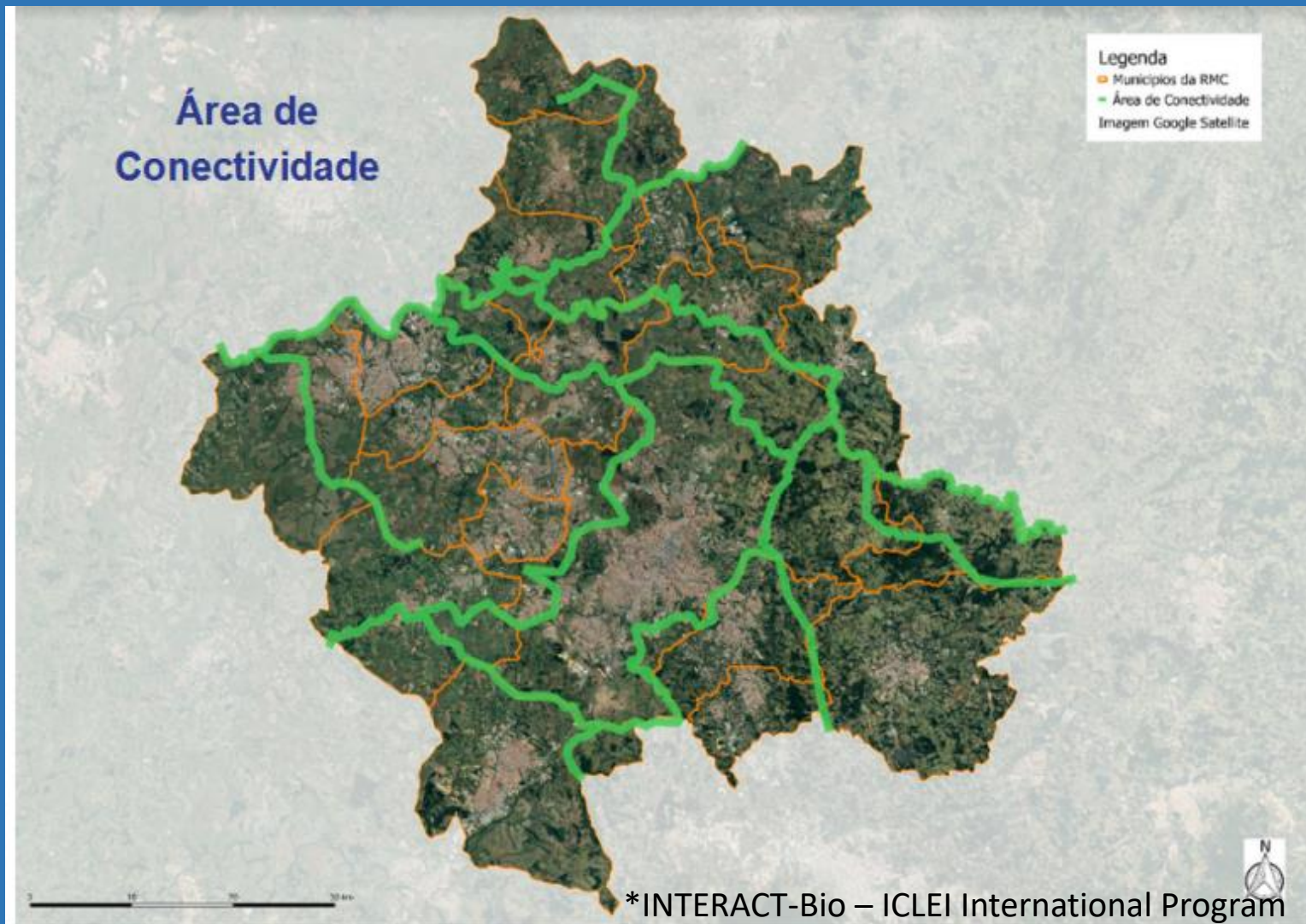


3ª Etapa – 30/06/17



4ª Etapa – 06/07/17

# *Reconnecta*\* Metropolitan Region Ecological Corridors



**São Paulo**

# Implemented Bottom-up Projects

2017



# Largo das Araucárias (Araucárias' Square) Rain Garden Ecosystems restoration in micro scale



2017

# Largo das Araucárias (Araucárias' Square) Rain Garden Ecosystems restoration in micro scale



April 2018  
Planted in December 2017



# Community planting with several green grassroots movements with basic support of local city administration





**Rain garden collects stormwater from estimated 1.000 m<sup>2</sup>  
60ml rain fell after planting, it has infiltrated in 4 hours,  
reducing run-off and flooding in the vicinity**







## Largo das Araucárias (Araucárias' Square)

### Pocket Forest

Part of intensive planting in paved  
and lawn areas





March 2017

## Largo das Araucárias (Araucárias' Square)

### Pocket Forest

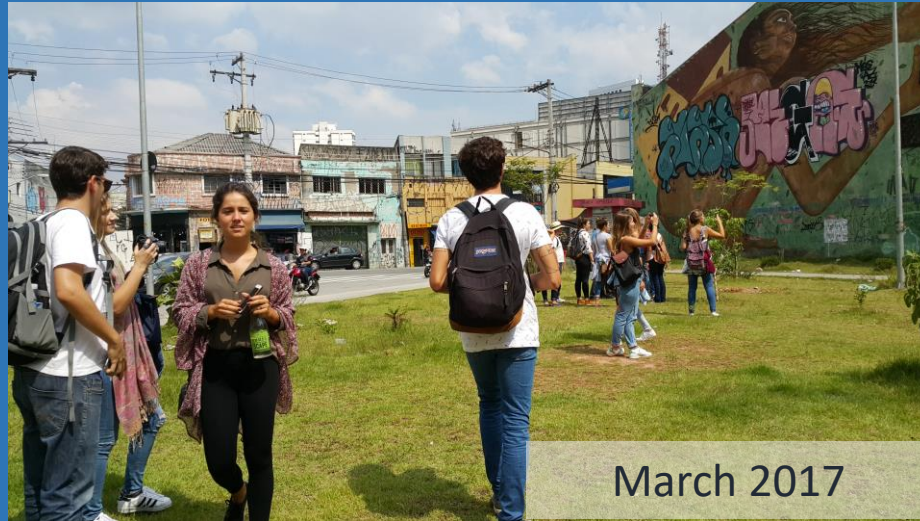
Part of intensive planting in paved  
and lawn areas



April 2018

Planted in June 2017





March 2017



April 2018  
Planted in June 2017



Pioneer rain garden in the  
street of São Paulo  
Fiandeiras' Street







## Spring's Square Ecological restoration of water springs in the city and native biodiversity





# Spring's Square

## Ecological restoration Savannah native biodiversity





# Horta das Corujas (Owls' Square)



2010



# Horta das Corujas (Owls' Square)



2010



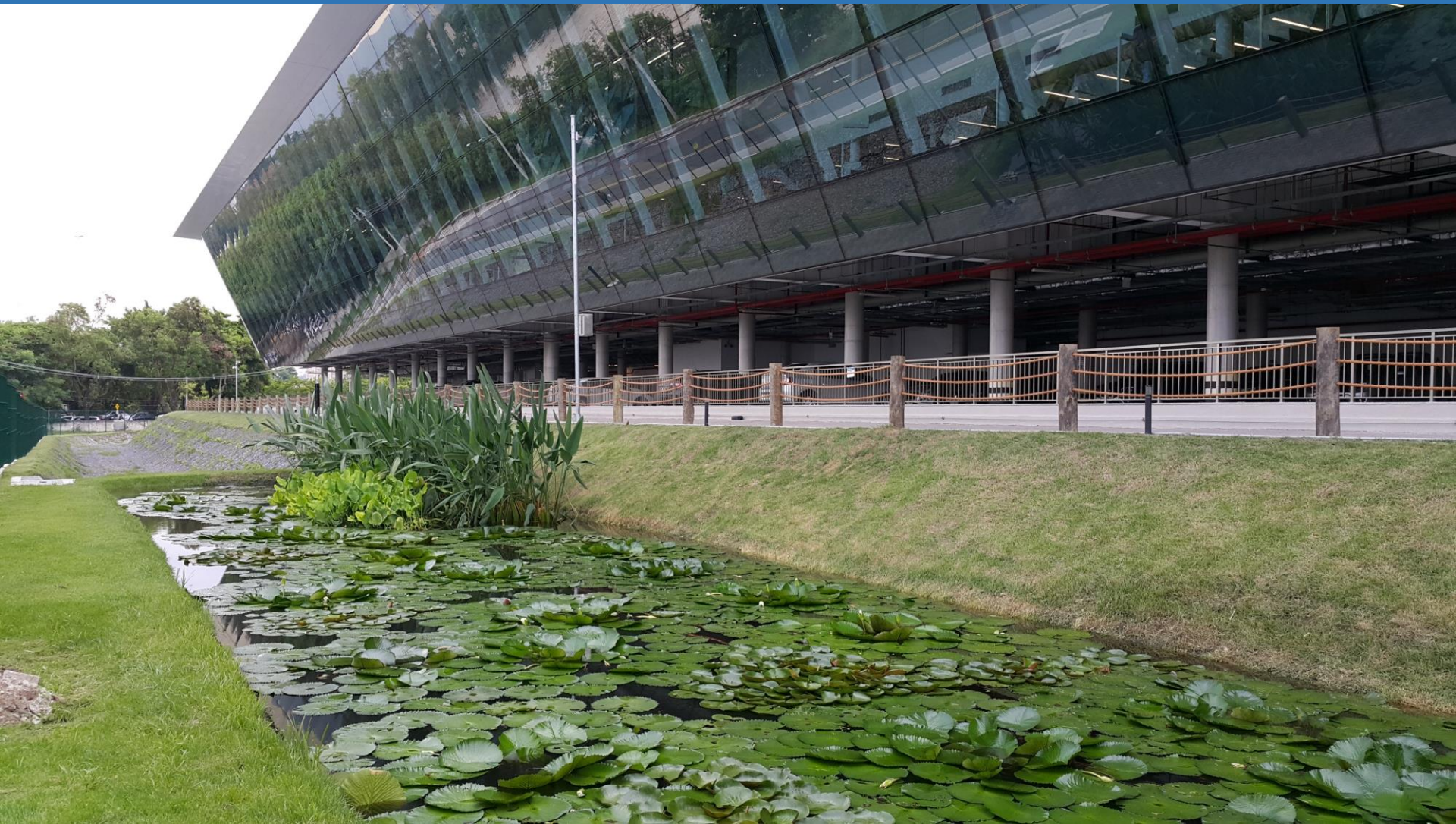
April 2018

**Rio de Janeiro**



**Institutional:  
Environmental Compensation**

# Phyto restoration of waste water treatment and reuse





# Combined filtration and phyto restoration sewage treatment and discharge in the Guanabara Bay





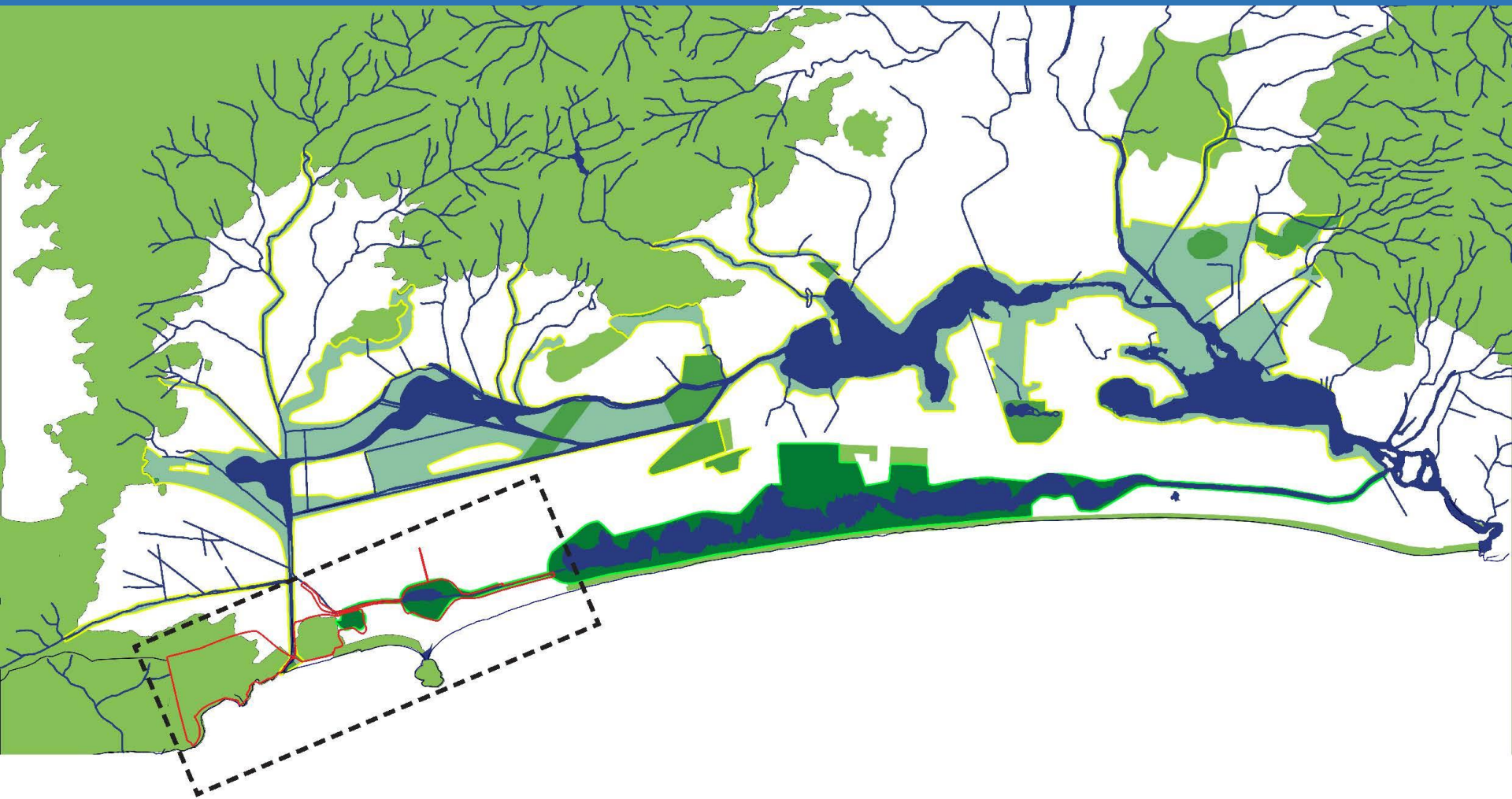








**Top-down  
with NGO and designers'  
participation funded by  
environmental compensation**



# Olympic Green Corridor

CORREDOR VERDE CANAL DAS TAXAS - CORREDOR VERDE OLÍMPICO



## Connection of Protect Areas: Marapendi, Chico Mendes Park, and Pedra Branca Park

MASTERPLAN



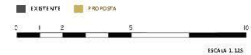
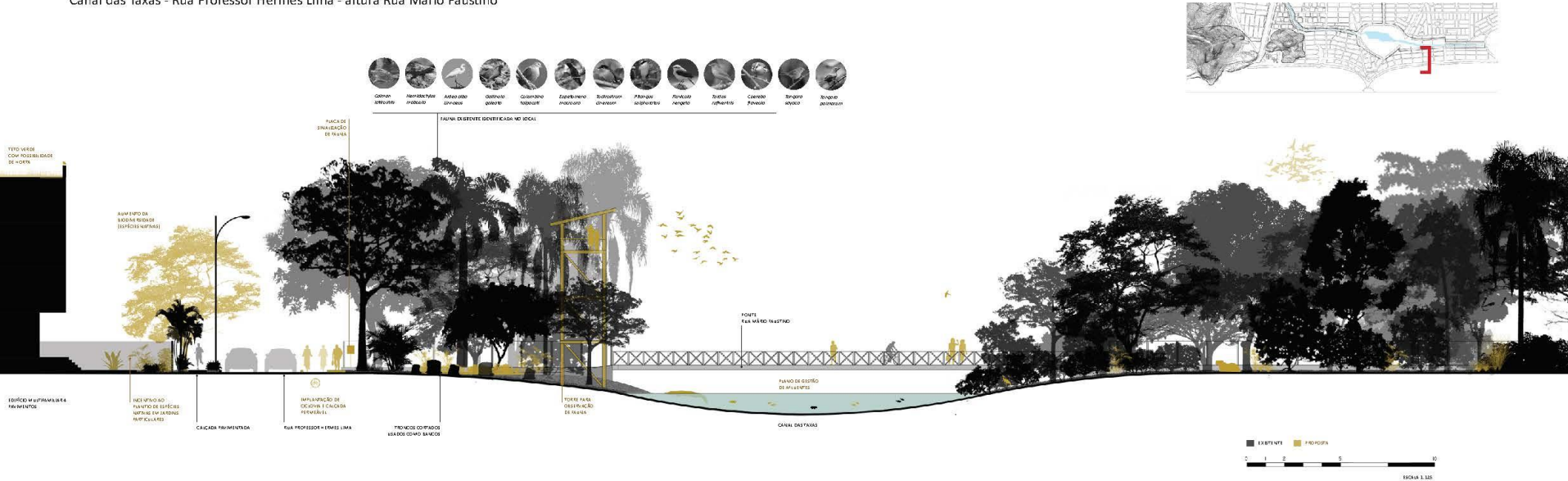
## CORTE 20 - DIRETRIZES DE INTERVENÇÃO

Canal das Taxas - Rua Professor Hermes Lima - altura Av. Pedro Moura

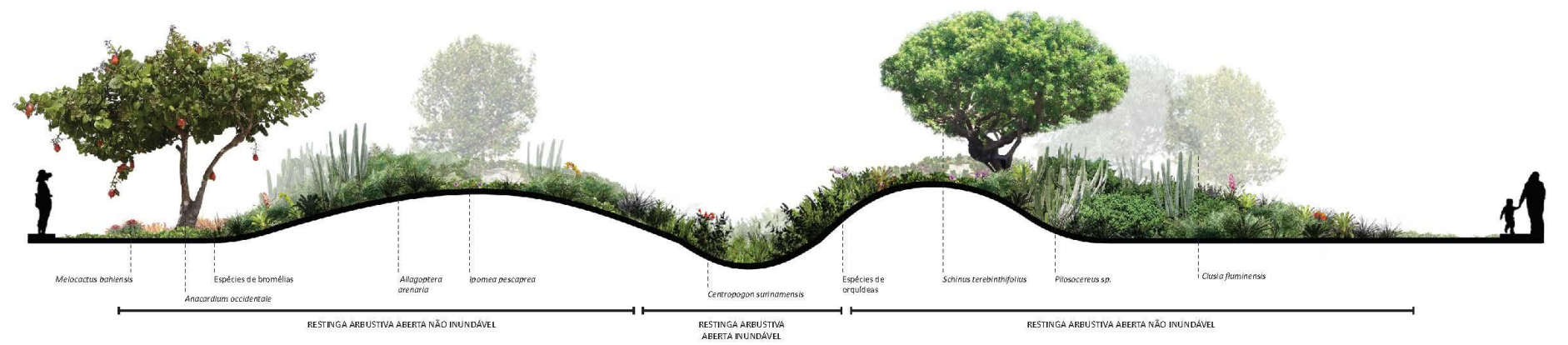
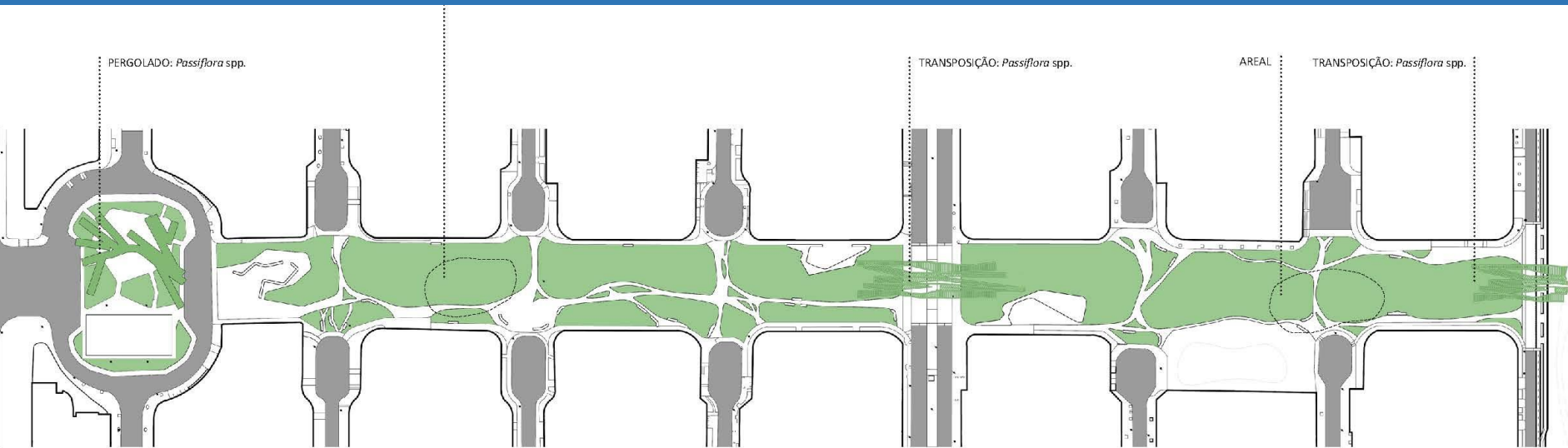


## CORTE 17 - DIRETRIZES DE INTERVENÇÃO

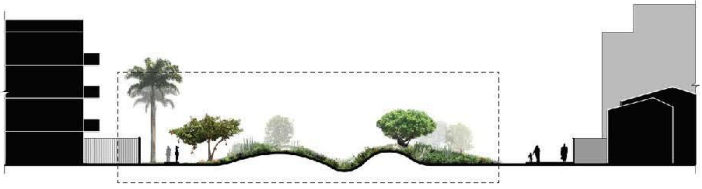
Canal das Taxas - Rua Professor Hermes Lima - altura Rua Mário Faustino



ESCALA 1:100



0 1 2 5  
CORTE ESQUEMÁTICO PADRÃO AMPLIADO



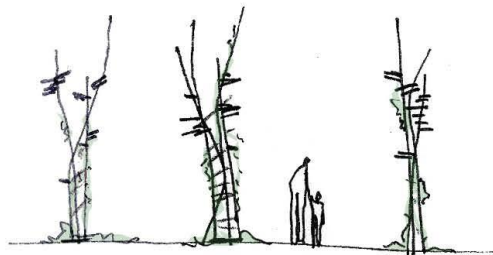
# Renaturation of dunes' dry ecosystem in a multifunctional pedestrian street

ALAMEDA SANDRA ALVIM - VEGETAÇÃO



## TOTENS PARA ATRAÇÃO DE FAUNA

Os totens para atração de fauna são estruturas esculturais em madeira e aço que possuem nichos para pássaros, borboletas, abelhas e outros animais polinizadores. Os poleiros para pássaros são em madeira plástica, possuem tamanho variável, e aberturas de 6 a 8 cm de diâmetro com o intuito de evitar que pombos façam seus ninhos nesses locais. O público será incentivado a disponibilizar alimento (frutas e grãos) para as aves, o que já fazem hoje em dia de modo improvisado.



Fonte: <http://goo.gl/mLcPCf>



Fonte: <http://goo.gl/HvsSDR>



Fonte: <http://goo.gl/CjQAvI>



Fonte: <http://goo.gl/X5l5e>

Referências projetuais para os totens: abrigos para animais polinizadores



Proposta de totem para atração de animais polinizadores









# Bottom-up

**“Teto Verde Favela” (Slum Green Roof)**

**Arará Slum resident’s initiative with academic and technical support of a researcher of IPJB**





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VISA

FORTLEV





CONCRETE  
-VA BELVA  
DM









European  
Commission

# Thanks!

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