Environmental System of the State of São Paulo

Programs and Actions of the Environmental System of the State of São Paulo

2018 Environmental Quality Report Section

Government of the State of São Paulo - Secretariat for the Environment
Environmental Planning Coordination

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São Paulo, 2018

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ZOOLÓGICO DE SÃO PAULO · Instituto de Botânica · INSTITUTO GEOLÓGICO · INSTITUTO FLORESTAL · FUNDAÇÃO FLORESTAL · CETESB · AmBienteSP Sistema Ambiental Paulista · STATE GOVERNMENT OF SÃO PAULO

Summary

1. Introduction

2018 Environmental Quality Report Section

1. Introduction

The most populated and industrialized state of Brazil, São Paulo is presented with enormous challenges regarding environmental aspects such as air quality, water pollution, the depletion of water sources to supply the metropolitan population, the demographic concentration in areas of risk, the erosion and contamination of agricultural land and the threat to the remnants of Mata Atlântica Forest and the Savannah, among other factors.

But despite these challenges, the emergence of public organizations, private and associative, aimed at improving the environmental quality has brought the state of São Paulo to prominence in the national and international scenarios in the transition process to an economy geared to the sustainable use of natural resources. The protocol that brought burnings to an end during sugar cane harvest is an expressive example of actions in pursuance of this transition.

This process requires articulation among the government, the private sector and the civil society. Promoting the transition to sustainable development is much more difficult than stimulating the construction of roads or the installation of new factories or plantations. Society knows what it means and adheres, in general without hesitation, to the idea that it is necessary to make the economy grow and create jobs. However, there is less clarity about how to do it in a sustainable manner, reducing the emission of pollutants, interrupting the process of biodiversity loss and reducing the use of the materials and energy needed for the production processes.

This transition into a form of relationship with the environment that ensures economic growth while reducing the pressure on natural resources, on which human societies depend, also involves the manner in which the government, the civil society and the private sector relate with environmental information. In this sense, it is of utmost importance that the State fulfils its role and provides information with regularity and in an accessible manner.

The Environmental Quality Report (RQA) integrates the State Policy of Environment (State Law no 9.509/1997) and aims at providing information on the quality of the environment in the state of São Paulo. Therefore, the State Secretariat for the Environment annually consolidates the information from the departments that comprise the State System of Management of Environmental Quality, Protection, Control and Development of the Environment and Adequate Use of Natural Resources (Seaqua) and discloses it to society, aiming at raising awareness for the conservation of the environment.

By providing information about the environment's status in São Paulo, the RQA supplies data to support the understanding of how the relationship between society and nature is built, and subsidies for the improvement of public policies that can contribute to a more balanced environment.

The information presented in the report are produced by various departments of the Environmental System of the State of São Paulo and by other official departments of the state, at different moments and with their own dynamics. For this reason there is no base year fixed for the RQA; the information displayed is the most recent updated until DEC/31/2017.

The maps in this report can be accessed by means of the geo-portal of the Secretariat for the Environment (DataGEO) at the electronic address <http://datageo.ambiente.sp.gov.br/>. The full content of the 2018 RQA can be accessed at the electronic address:
https://www.infraestruturameioambiente.sp.gov.br/cpla/2019/01/relatorio-de-qualidade-ambiental-2018/

2. Characterization and Geographical Division of the State of São Paulo

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2. Characterization and Geographical Division of the State of São Paulo

Located in the Southeastern region of Brazil (Figure 2.1), the state of São Paulo is the member of the federation with the greatest economic importance in the country. Its importance is confirmed by means of the consistency of indicators that reflect the relevance of its industry, its activities related to the agribusiness and the financial sector, its international trade and its population on the one hand, and the Research and Development (R&D) capacity of its institutions on the other, thus promoting important advancements in science and technology.

FIGURE 2.1

CONSTITUENT REGIONS AND STATES OF BRAZIL

Source: IBGE, prepared by SMA/CPLA (2018).

Composed of 645 municipalities and covering an area that corresponds to only 2.9% of the Brazilian territory, São Paulo has the largest economy of the country, with a Gross Domestic Product (GDP) which totals 32.4% of the entire national wealth produced in 2015 (IBGE, 2018a). The state also has the largest population among the federation units, with a number estimated at more than 43.6 million inhabitants in 2017 (SEADE,

2018a), representing 21% of the more than 207 million people estimated for Brazil by the Brazilian Institute of Geography and Statistics for the same year (IBGE, 2018b).

The state of São Paulo is one of the main destinations of tourists in Brazil, with 70 resort cities and other 97 municipalities in the category of touristic interest. There are 34 touristic regions with 44 regional touristic circuits and itineraries, 19 road segments and 3 interstate routes (SETUR, 2017; State Law nº 16.720/2018).

Regarding its biodiversity, the original biomes found in São Paulo are the Mata Atlântica Forest and the Savannah. Estimates reveal that, at the time of the discovery of Brazil, the Mata Atlântica Forest covered approximately 81% of the area of the state, and the remainder was covered primarily by the Savannah and natural fields. Grazing for livestock, agricultural crops, reforestation using commercial species, extensive areas of sugar cane plantations and urbanized areas replaced the original ecosystems, whose remnants currently cover 17.5% of the territory (SMA/IF, 2010).

The city of São Paulo is the most populous in the Southern Hemisphere and is inserted in the Metropolitan Region (RM) of São Paulo, which is the largest metropolis in the country and one of the five major conurbations in the world. The state has the Metropolitan Regions of Campinas, Baixada Santista, Paraíba Valley and Northern Coast, Sorocaba and Ribeirão Preto.

Except for the RM of Ribeirão Preto, the others have a geographical proximity which, together with the economic dynamics established among them and adjacent regions such as the Urban Agglomerations of Jundiaí and Piracicaba, in addition to the microregion of Bragantina, contributed to an urban conformation referred to by the São Paulo Metropolitan Planning Organization (Emplasa) as “Macro Metropolis Paulista”, a cluster of municipalities that concentrate the largest part of the population of the state, the largest airports for passengers and cargo (Guarulhos, Congonhas and Viracopos), the largest port (Santos) and the densest road and railroad systems in the country. Renowned universities and research institutes, such as the University of São Paulo (USP), the State University of Campinas (Unicamp), the State University of São Paulo (Unesp), the National Institute for Space Research (INPE) and the Institute for Technological Research (IPT), in addition to companies and industries of great national importance are also located in the region (EMPLASA, 2012).

Some medium or large sized cities in the countryside of the state of São Paulo, located outside the Macro Metropolis, are among those with the biggest growth, consolidating themselves as important regional poles; Presidente Prudente, Bauru, São José do Rio Preto, Araçatuba, Marília, Araraquara, São Carlos and Barretos are good examples. These municipalities are strategically located in areas with good transport and technology infrastructure, which enable their development and connection with other regions of Brazil.

3. Programs and Actions of the Environmental System of the State of São Paulo

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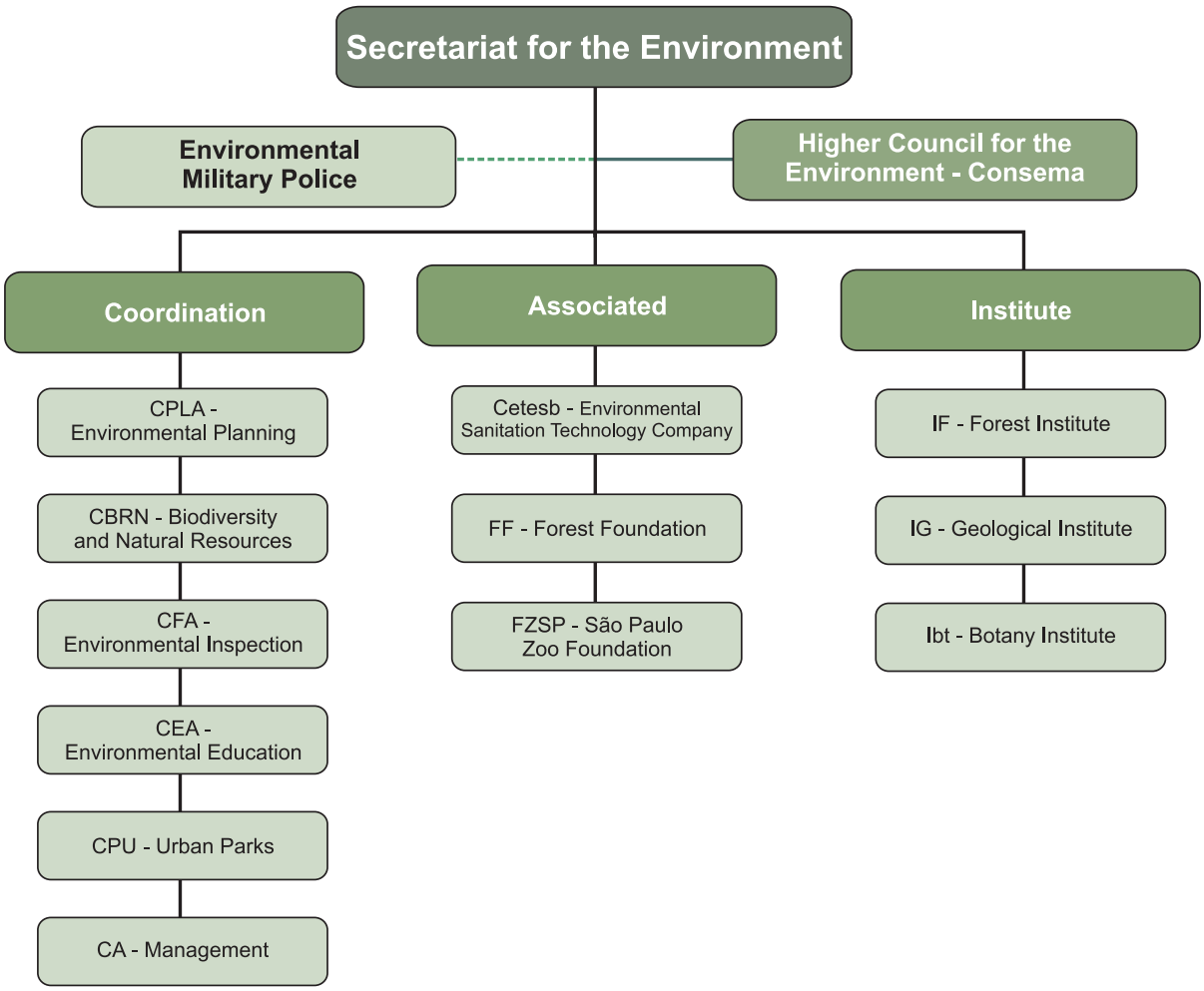
3 - Programs and Actions of the Environmental System of the State of São Paulo

This chapter presents the main Programs and Actions of the Environmental System of the State of São Paulo. The target is not to cover all the actions undertaken by AmbienteSP, because much of the work for the protection and conservation of the environment is a continuous one and part of the everyday life of the teams working in the environment area of the administration of the state of São Paulo, which would require the presentation of an excessive quantity of information and make the delivery of this document nearly impossible.

The expectation of this publication is that the society of São Paulo and all other stakeholders have access to this information and can monitor the results and the effects of these actions on the indicators of environmental quality of the state of São Paulo. Additional information about these and other programs can be accessed by means of the communication channels of the Secretariat for the Environment of the State of São Paulo, at its electronic address (http://www.ambiente.sp.gov.br).

Environmental System of the State of São Paulo



Ecological-Economic Zoning (ZEE)

In the state of São Paulo, State Law nº 9.509/1997 (State Environmental Policy) already dealt with planning and environmental zoning as one of its guiding principles, but it was State Law nº 13.798/2009 (State Policy on Climate Change - PEMC), regulated by State Decree nº 55.947/2010, which defined the implementation of ZEE for the entire state.

In this more comprehensive territorial context, Ecological-Economic Zoning is understood as a technical and political planning instrument, which establishes guidelines for the development and management of the territory, taking the environmental characteristics and socioeconomic dynamics of different regions of the state into account.

The purpose of the ZEE is to subsidize the formulation of public policies and investment planning which is in line with the strategic guidelines of sustainable development, as well as to support the environmental licensing of activities and joint ventures in a manner consistent with these objectives. The instrument defines portions of the territory that have common vulnerabilities and common socioeconomic and natural potentialities, and establishes guidelines and goals agreed upon with society at large.

The ZEE also aims at providing integrated and georeferenced information about the state of São Paulo, allowing for a wide availability of data to subsidize public discussions around the goals in terms of regulation and appropriation of land and territory.

The process of construction of the ZEE-SP is in progress, with the institution Resolution SMA nº 14/2016, which created the Work Group responsible for the coordination and development of the activities related to the formulation of the Ecological Economic Zoning of the State of São Paulo and the realization of regional workshops for the collaborative construction of the instrument.

Management of Contaminated Areas

Since 2002, the Environmental Sanitation Technology Company (Cetesb) has been publicizing the list of contaminated areas in the state of São Paulo annually. The data in the list are obtained by the Board of Control and Environmental Licensing by means of inspection actions, and during the licensing process of activities.

In 2009, in order to establish a public policy that supports the implementation of the management of contaminated areas, especially their identification and rehabilitation, State Law nº 13.577 was enacted.

The law also determines the conditions for the application of the procedures for the management of contaminated areas, emphasizing the actions regarding the process of identification and remediation, the selection of the most important areas, the creation of economic instruments to finance the investigation and remediation, and the support to future initiatives for the revitalization of abandoned industrial regions.

The main instruments for the management of contaminated areas established by this piece of legislation are: registration, declaration of voluntary information, Project Decommissioning Plan, Remediation Plan, and State Fund for the Prevention and Remediation of Contaminated Areas (Feprac), among others. The resources can be requested by departments or entities of the direct or indirect public administration, intermunicipal consortiums, concessionaires of utility services, companies and individuals.

In order to facilitate the management of these areas, as a result of the level of information or existing risks in each one, Cetesb has established a classification whose criteria were revised in 2013, as follows:

- Contaminated Area under Investigation (ACI) - an area where confirmatory research has found concentrations of pollutants that put, or may put, the assets to be protected at risk;

- Contaminated Area with Confirmed Risk (ACRi) - an area where detailed investigation and risk assessment have found contamination of soil or groundwater, the existence of risks to health or to human life, ecological risks, or where acceptable legal standards have been exceeded;

- Contaminated Area in the Process of Remediation (ACRe) - an area where remediation measures are being applied to eliminate the contaminant mass or, that being technically or economically impossible, measures are being applied to reduce or contain or isolate such mass;

- Area under Monitoring Process for Closure (AME) - an area in which no risk was found, or where the remediation goals were achieved after remediation measures were deployed and which is now under a monitoring process to check the maintenance of concentrations at acceptable levels;

- Rehabilitated Area for Declared Use (AR) - area, terrain, site, installation, construction or improvement which was previously contaminated and that has been subject to intervention measures, which may not have completely eliminated the contamination mass but have restored it to acceptable levels of risk to the human health, the environment and to other assets to protect;

- Critically Contaminated Area (ACcrítica) - contaminated areas which, as a result of damages or risks, pose imminent risk to the human life or health, create restlessness in the population or cause conflicts between the actors involved, and require immediate intervention by those responsible for it or by the public power, requiring different implementation in terms of intervention, risk communication and information management;

- Contaminated Area in the Process of Reuse (ACRu) - contaminated area where the intended use for the land is expected to be different from that which gave rise to the contamination in the first place, with the elimination or reduction to acceptable levels, of the risks to the assets to be protected as a result of the contamination.

As a means of assessing the effectiveness of the remediation processes applied to the contaminated areas of the state, Table 3.1 shows the Index of Rehabilitation of Contaminated Areas, as well as the distribution of the Registered Contaminated Areas, ranked by status of rehabilitation from 2013 to 2017. The Index of Rehabilitation of Contaminated Areas is the ratio between the sum of the Areas under Monitoring Process for Closure (AME) and the Rehabilitated Areas (AR), and the total number of contaminated areas registered.

TABLE 3.1

INDEX OF REHABILITATION AND CLASSIFICATION OF CONTAMINATED AREAS IN THE STATE OF SÃO PAULO FROM 2013 TO 2017

Year	AR	ACRe	AME	ACI	ACRu	ACRi	Total	Rehabilitation Index (%)
2013	425	1,556	987	1,047	32	724	4,771	29.6
2014	563	1,635	1,204	1,028	87	631	5,148	34.3
2015	680	1,617	1,307	1,067	88	617	5,376	36.9
2016	987	1,631	1,424	1,025	74	521	5,662	42.6
2017	1,184	1,525	1,459	632	241	901	5,942	44.4

Source: Cetesb (2018h), prepared by SMA/CPLA (2018).

Note: Rehabilitation Index = (AR+AME)/Total*100%.

The Rehabilitation Index of Contaminated Areas has been improving, having increased from 29.6% in 2013 to 44.4% in 2017. Table 3.2 presents data per UGRHI (Hydrographic Unit for Water Resources Management), according to the new classification adopted in 2013.

TABLE 3.2

INDEX OF REHABILITATION AND CLASSIFICATION OF CONTAMINATED AREAS BY UGRHI UNTIL DEC/2017

UGRHI	Classification							Rehabilitation Index (%)
	AR	ACRe	AME	ACI	ACRu	ACRi	Total	
01 – Mantiqueira	0	2	8	1	0	2	13	61.5
02 – Paraíba do Sul	17	115	74	43	0	46	295	30.8
03 – Litoral Norte	14	12	31	3	0	4	64	70.3
04 – Pardo	27	11	56	3	3	5	105	79.0
05 – Piracicaba/Capivari/Jundiaí	126	190	203	152	21	152	844	38.9
06 – Alto Tietê	749	768	696	261	198	486	3,158	45.7
07 – Baixada Santista	70	104	41	17	3	25	260	42.6
08 – Sapucaí/Grande	8	14	34	4	0	6	66	63.6
09 – Mogi-Guaçu	15	41	46	13	2	21	138	44.2
10 – Sorocaba/Médio Tietê	16	44	33	39	5	49	186	26.3
11 – Ribeira de Iguape/Litoral Sul	3	31	4	10	3	22	73	9.5
12 – Baixo Pardo/Grande	6	10	20	3	1	8	48	54.1
13 – Tietê/Jacaré	23	29	40	9	0	12	113	55.7
14 – Alto Paranapanema	8	42	48	20	2	18	138	40.5
15 – Turvo/Grande	61	29	57	8	0	11	166	71.0
16 – Tietê/Batalha	14	15	24	6	0	8	67	56.7
17 – Médio Paranapanema	9	10	4	5	0	2	30	43.3
18 – São José dos Dourados	7	5	11	4	0	1	28	64.2
19 – Baixo Tietê	7	18	23	12	2	10	72	41.6
20 – Aguapeí	2	15	2	2	1	5	27	14.8
21 – Peixe	1	9	2	10	0	6	28	10.7
22 – Pontal do Paranapanema	1	11	2	7	0	2	23	13.0
State of São Paulo	**1,184**	**1,525**	**1,459**	**632**	**241**	**901**	**5,942**	**44.4**

Source: Cetesb (2018h), prepared by SMA/CPLA (2018).

Atmospheric Emissions Control Plan

State Decree nº 59.113/2013 established new standards for air quality and set guidelines for air quality management in order to achieve the quality standards proposed by WHO so that atmospheric pollution is reduced to desirable levels over time.

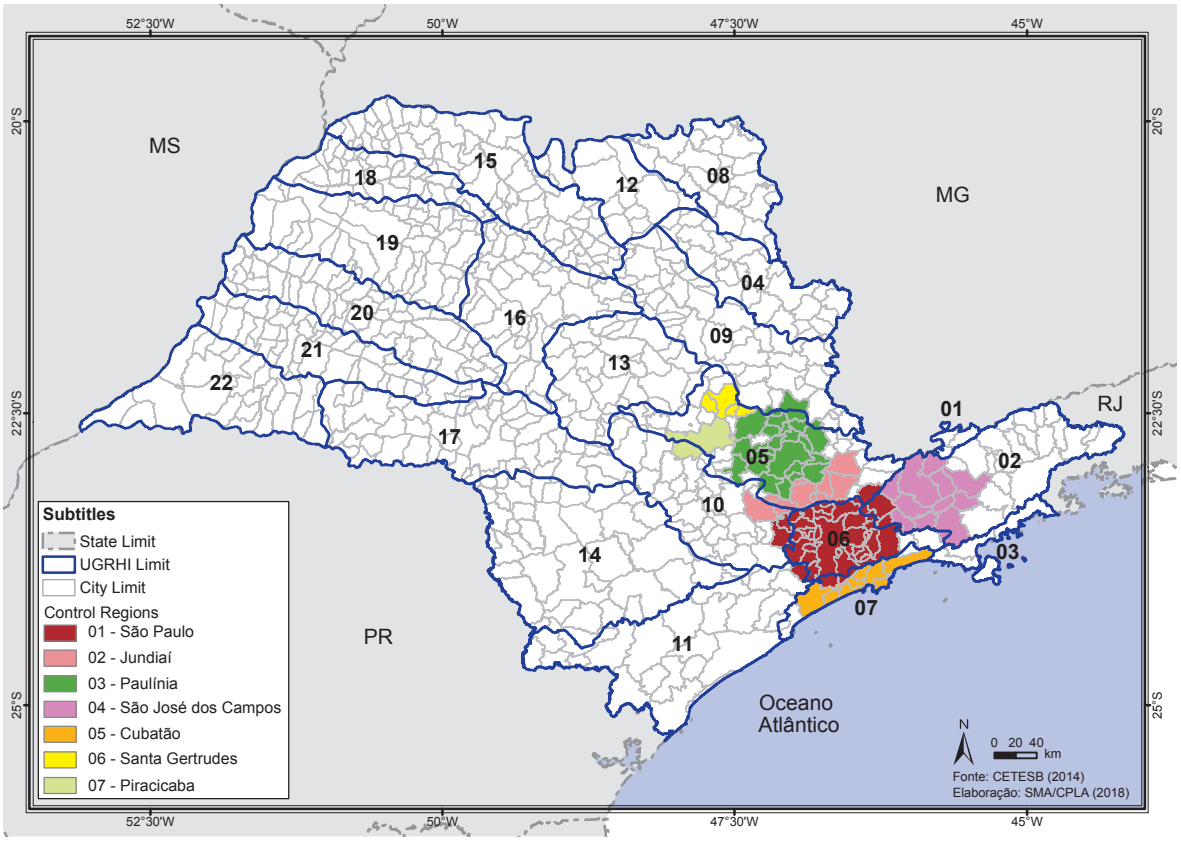
The Decree determines that Cetesb establishes, according to the duration of each air quality standard and for each sub-region, a plan for the control of atmospheric emissions, composed of a Plan for the Reduction in Emissions from Stationary Sources (PREFE) in conjunction with the Vehicle Pollution Control Plan (PCPV), for the sources of pollution which are in operation.

Plan for the Reduction in Emissions from Stationary Sources (PREFE)

PREFE establishes the planning of actions to fulfill current air quality standards. PREFE 2014's target are the regions which are in non-compliance with the level referred to as Intermediate Goal 1 (MI1), aiming for the reduction and elimination of non-conformities observed in air quality over time, favoring the protection of public health. Figure 3.1 shows the seven Control Regions under PREFE 2014.

FIGURE 3.1

CONTROL REGIONS UNDER PREFE



Source: Cetesb (2014), prepared by SMA/CPLA (2018).

PREFE 2014 adopted a specific type of area division called Control Region (RC), in order to rationalize the efforts that will be necessary for the implementation of control actions to reduce the concentration of pollutants in the critical areas in "Non-Compliance". The definition of the perimeters of each Control Region took into consideration the similarities in air quality, the similarity of sources, the magnitude of receptors concentration, the groups of reduction targets and the concentration of specific activities in groups of municipalities.

To meet the standards of air quality, PREFE establishes goals proportional to the participation of mobile and stationary sources in the total emissions of the sub-region and adopts guidelines and instruments such as:

- Classification of air quality monitoring stations regarding the standards;
- Inventory of stationary and mobile sources;
- List of projects making a bigger contribution to the criticality conditions in air quality in each sub-region, considering the information available in the inventory of sources and in the environmental licensing;
- Goals calculated based on the difference between the averages of classification concentration of the sub-region in the last 3 years and the quality standard to be met;
- Participation of reduction in emissions from stationary and mobile sources, calculated on the basis of the inventory;
- Convergence with plans, programs, actions and goals defined to meet the State Policy on Climate Change;
- Studies for the adoption of tax incentive measures for actions that lead to the reduction in pollutant emissions;
- Monitoring national or international best practices aimed at improving air quality and the feasibility study to implement such practices;
- Planning the expansion of the monitoring network;
- Priority to the renewal of the Operation License of those projects which are part of PREFE, linking them to the special technical demands.

As established in the Decree, PREFE is a plan of continuous action to control pollution, and it should be updated and validated every three years.

PREFE 2014 is in the wrap up phase regarding company diagnosis, and in the definition stage of goals and actions to be implemented in companies diverging from the State Decree nº 59.113/2013, and of the procedures to be adopted by the Fuel Bases. In 2017, the Best Practical Technology Available Guide (MTPD) was published to assist in the diagnosis of the atmospheric emission sources in the state of São Paulo. This guide is available on Cetesb's website.

Vehicular Pollution Control Plan (PCPV)

Vehicular Pollution Control Plans (PCPV) became mandatory after the approval of Resolution Conama nº 418/2009, and must be prepared by state environmental departments and reviewed at least every 3 years. São Paulo's PCPV also seeks to meet air quality standards established by State Decree nº 59.113/2013, to reduce the quantities of pollutants and gases emitted by motor vehicles and to promote air quality improvement in regions that have high concentration levels of tropospheric ozone and particulate material.

Cetesb has updated PCPV for the 2017-2019 period taking into consideration the current classification of air quality established by Resolution Consema nº 18/2016 (Higher Council for the Environment) and adopted a new approach to the issue of emissions concentrated along heavy vehicle flow tracks.

São Paulo's PCPV takes into consideration the diagnosis of air quality and the fleet of vehicles circulating in the state. During the drafting phase, the regions of the state and the typology of vehicles which should be a priority for the establishment of emission control and prevention programs were identified, with emphasis to the Macro Metropolis of São Paulo and for the diesel fleet.

PCPV established actions and recommendations necessary for vehicular emission control, in order to seek the improvement or maintenance of air quality in urban areas in São Paulo. It also proposed the adoption of

various actions that allow the reduction in emissions of pollutants and greenhouse gas effect (GHG). For each action, targets and monitoring indicators, which will be published in the annual report of *Vehicular Emissions in the State of São Paulo*, were established. The actions described in the PCPV are listed below.

Environmental Inspection of Vehicles

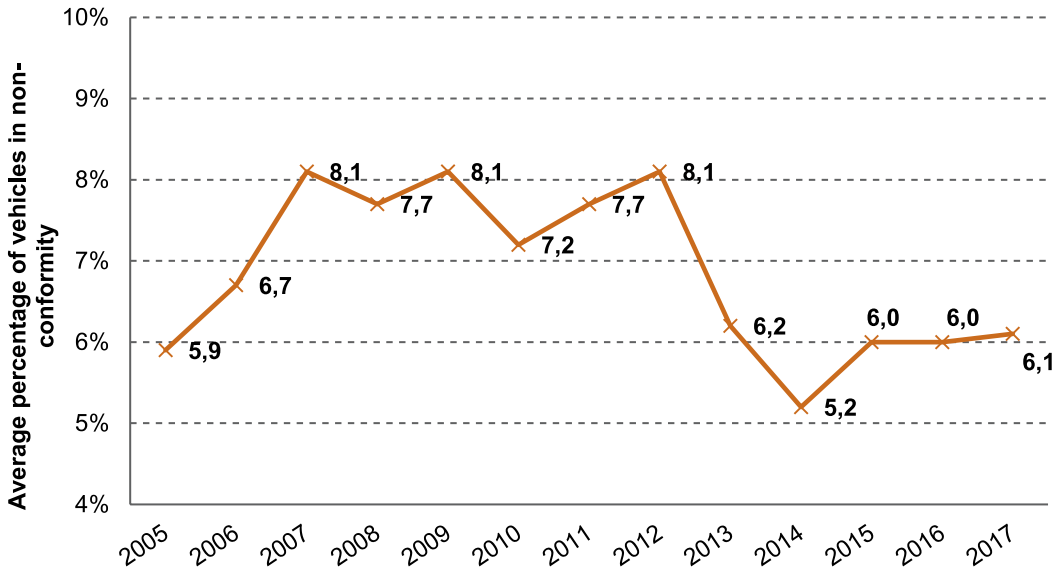
Being fundamental to control the emission of vehicles in use, the environmental inspection is designed to be implemented in stages which, over time, will reach all diesel vehicles in the state and all other vehicles in the Macro Metropolis of São Paulo. The goal is to prepare and deploy the program over a period of 36 months as soon as the legal, juridical and budgetary requirements are met. The Government of the State of São Paulo sent Bill nº 1.187/2009 to the House of Representatives and it is still being analyzed. In 2017, the National Traffic Council adopted a resolution that hinted at the initiative to establish safety inspection programs in conjunction with state environmental inspection. Cetesb and the Traffic Department (Detran-SP) began the work of inspection design. However, the resolution was suspended in April 2018 and state departments still await the legal definition to restart the work.

Black Smoke Inspection in Diesel Vehicles

Cetesb inspects black smoke emissions from vehicles with a diesel engine by enforcing state environmental legislation and applied 11.5 traffic tickets in 2017. Figure 3.2 shows the non-conformity index of diesel vehicles from 2005 to 2017 in the Metropolitan Region of São Paulo. The goal is that the non-conformity percentage does not exceed 6% ± 2%.

FIGURE 3.2

NON-CONFORMITY INDEX OF DIESEL VEHICLES IN THE METROPOLITAN REGION OF SÃO PAULO FROM 2005 TO 2017



Source and preparation: Cetesb (2018i).

[Translator's Note: in the graphic, read the comma as a dot]

Winter operation

Since 1984, Cetesb has annually developed the Operation Winter, from June to August, covering the period in which the weather conditions are unfavorable to the dispersion of pollutants mainly because of a phenomenon known as thermal inversion. It consists in intensifying the inspection operations of smoke and promoting orientation campaigns. The goals for this action are the inspection of 150 thousand vehicles and the realization of two orientation actions every year.

Monitoring using the opacimeter

The opacimeter is an instrument used to evaluate the adjustment of diesel-powered vehicles to more modern emission control systems, which are not properly checked with regular inspection. Cetesb has two cars equipped with opacimeters. The goal is to inspect 120 vehicles per year.

ARLA 32 Inspection

The NOx Liquid Automotive Reducing Agent (ARLA 32) is a raw material used to reduce emissions in more modern diesel-powered vehicles. Several ways to defraud the use of that raw material, which leads to a significant increase in emissions, have been detected, . To mitigate the fraud, the goal is to carry out inspections on vehicles and gas stations that sell the product, performing 60 and 600 inspections per year, respectively.

Expansion of the Program for Diesel Vehicles Maintenance Improvement (PMMVD)

Since 1998, Cetesb develops PMMVD, which consists of a network of companies that provide services in accordance with established quality standards in order to minimize pollutant emissions.

PMMVD currently has 157 units registered in the state, which are equipped to measure the smoke opacity from diesel-powered vehicles and inform owners about the vehicle actual maintenance conditions. This process allows the owner to request a benefit equivalent to a 70% reduction of the ticket value due to black smoke emissions above the legal limit. Approximately 12% of the owners made the request. In a horizon of three years, the goal is to increase the percentage to 25% of the tickets applied.

Incentives to the environmental management of fleets and garages

Cetesb should prepare a handbook about the environmental management of fleets and garages still in 2018 to encourage the adoption of environmental management practices in organizations that have fleets of vehicles or provide transportation services.

Improvement of Proconve and Promot

Over the past few years, the Control Program of Air Pollution by Motor Vehicles (Proconve) and the Control Program of Air Pollution by Motorcycles and Similar Vehicles (Promot) have started the last stages of the current phases in all categories (L6, P7, MAR-1 and M4). In 2017, Cetesb presented to SMA and Ibama proposals regarding Conama Resolution for the deployment of new stages, including an unprecedented proposal for the control of GHG emissions in vehicles. Many are the aspects and parameters subject to new controls. Among others, new standards for heavy duty vehicles (trucks and buses) in alignment with the laws applied in all countries that have large movement of vehicles, the control of fuel vapor emissions during tank fill-up and the introduction of emission tests under real conditions of vehicle use.

Vehicular emission laboratories

Currently, Cetesb has two vehicular emission laboratories equipped to perform tests to determine pollutants in light and heavy vehicles. One of the laboratories is installed at Cetesb's headquarters in São Paulo since October 1977, and the other, in São Bernardo do Campo, was inaugurated in January 2017. The laboratory dedicated to light vehicles of the Otto Cycle of São Paulo, accredited by Inmetro (National Institute of Metrology, Quality and Technology), has obtained an update in the controller of the capture system of exhaust fumes, and is equipped to perform tests within its accreditation scope. The new laboratory dedicated to the diesel cycle vehicles is currently implementing the quality management system to obtain accreditation by Inmetro until 2019.

Capacitation

Cetesb will annually offer training courses in the area of vehicle emissions and vehicle inspection.

Recommendations

PCPV recommends additional measures to reduce the impact of vehicular activity on air quality and on GHG emissions. Among them, the reduction in stimulated motorized journeys, or journeys reduced by

environmental policy; the incentive to non-motorized modals and to public transportation; the adoption of contract clauses with environmental criteria when hiring transportation services; the adoption of energy efficiency criteria when acquiring vehicles in the public sector; the use of low-sulfur fuel and the use of biofuels, are worth mentioning. Finally, PCPV recommends maintaining the veto on the use of diesel in passenger cars, by understanding that the use of this fuel in urban centers impacts air quality negatively.

Environmental Technical Councils

The Environmental Councils are collegiate consulting forums, each of which formed by components of the Environmental System of the state of São Paulo and of the entities linked to the productive and infrastructure sectors of the state of São Paulo, and aim at promoting environmental quality improvement by means of the interaction between the public sector and these sectors as a whole.

The Environmental Councils have jurisdiction: to evaluate and propose rules, procedures and instruments regarding environmental management, as well as changes in existing ones; to propose innovations and improvements to the environmental legislation in force; to contribute to the establishment of communication programs aimed at disseminating the rules, procedures, legislation and instruments regarding environmental management; to promote human resources training on topics related to environmental management; to propose guidelines and articulate actions aimed at encouraging the economical and environmentally sustainable use of natural resources; the rational use of water by means of its conservation and reuse; the minimization, recycling, treatment and proper disposal of solid, liquid and gaseous wastes; the improvement of methods and technologies deployed in the production and control of pollution to make them environmentally effective; the management of environmental liabilities, contemplating their identification, diagnosis and mitigation measures; the prevention and reduction in the occurrence of accidents; the participation of the productive sectors in the Water Resources Management System; the communication between those sectors and society for the dissemination of their activities; the establishment of instruments and criteria for the measurement of environmental gains, seeking to consolidate indicators of environmental quality and the reduction in greenhouse gas emissions; to disclose, guide, explain and encourage the sustainable consumption, aiming for the introduction of environmental criteria in the procurement of goods and services; and to deal with other matters regarding environmental issues.

To contribute, enrich and give transparency to the process of analysis and approval of products proposed by the Environmental Councils, an important instrument was adopted: public consultation. This process increases the possibility of the participation of society in the decision-making process of important actions and public policies developed in the Councils. In this sense, in 2017, four tasks were produced, including reports, procedures and normative propositions; three public consultations, with emphasis to the publication of the Manual of Strategic Environmental Actions - Graxaria - 2017, and the edition of the Internal Rules of the Environmental Councils - 2017.

State Program for Natural Disaster Prevention and Geological Hazard Reduction (PDN)

In force since 2011, the State Program for Natural Disaster Prevention and Geological Hazard Reduction- PDN (State Decree nº 57.512/2011) deals with the prevention of disaster risks in a wide and articulated manner, aiming at reducing vulnerabilities, minimizing losses and enhancing the capacity to cope with emergency situations and the existing risks. This public policy has been a pioneer in Brazil, innovating the way to deal with the problems related to the occurrence of natural disasters and geological risks, indicating ways to prevent, reduce, manage and mitigate risk situations (VEDOVELLO et al., 2015). Thus, it sought to articulate the actions, programs and projects of Government Secretariats and public institutions of the state of São Paulo working within the theme of disaster risks.

PDN is coordinated by the State Office of Civil Defense (Cedec), which is part of the Military Secretariat. It is formed by a Deliberative Committee, which includes the Secretaries of State and the Group of Articulation of Executive Actions (GAAE-PDN), which has a technical character, and is constituted by representatives of municipal secretariats and state public institutions working with the prevention of disaster risks (BROLLO; TOMINAGA, 2012).

In 2012, GAAE-PDN produced a report (BROLLO; TOMINAGA, 2012), in which: 73 actions, either developed or underway; 18 actions for short term implementation, and 31 actions for mid-term implementation (2013 to 2020) were identified. These actions were integrated into five strategic products:

a) Directive Plan for the integration of information on risk areas;

b) Evaluation Mapping Plan of risk areas in the state of São Paulo;

c) Plan for the expansion and improvement of the Preventive and Contingency plans, of the monitoring and of the response to emergencies;

d) Plan for the mitigation of risk areas - housing and construction work in high-risk areas;

e) Plan for risk perception capacitation.

PDN's objectives are:

- To promote updated diagnosis of the dangers and risks of landslides, floods and soil erosion and collapse, establishing priorities to map the existing risk areas in the state of São Paulo;
- To develop planning strategies for land use and occupation, for territorial rules and for environmental planning in order to promote a suitable occupation of the territory;
- To integrate and stimulate monitoring and surveillance strategies in high-risk areas and in areas prone to geological hazards to prevent the expansion of such areas and harmful accidents;
- To systematize institutional actions and operational procedures for the reduction, mitigation and eradication of risk, in line with the policies in progress within the State Secretaries and municipalities;
- To promote the capacitation and the training for municipal staff and other agents with responsibilities in risk management, as well as the dissemination of information and knowledge about the situations of risk to the population, increasing awareness and community participation in the search for solutions.

The expectation for the next years is that disaster risk management will improve, and, therefore, so will response indicators, which may occur in function of preoccupations and of institutional actions and policies that have been evidenced in recent years.

However, the impact of these actions on situational indicators may take some time, even decades, to show, since a lot of accidents arise from the effects of occupation in inappropriate areas associated with climate change and disastrous events subject to high variability. Therefore, there is dependency between the implementation of public policies regarding planning, housing, construction work, research and development

and the inspection and monitoring. In this sense, some actions and projects currently being undertaken in the state of São Paulo by its public institutions of the executive power are summarized below.

- Implementation of the Civil Defense Project, with a proposal of articulated actions between various components of the PDN; elaboration of studies in risk areas; training of municipal Civil Defense agents to monitor risk areas and deployment of Civil Defense Municipal Plans. Responsible: Cedec.
- Mapping execution in risk areas in the municipalities of the Metropolitan Region of São Paulo, and part of the São Paulo coastline. Responsible: Geological Institute.
- Development of DataGEO by the Coordination of Environmental Planning of the Secretariat for the Environment, which allows for the organization, standardization and sharing of environmental information among the various departments of the state. Responsible: Secretariat for the Environment/CPLA
- Structural actions for risk reduction, with the implementation of contention construction work and geotechnical consolidation in the Metropolitan Region of São Paulo; execution of urbanization work in Irregular Settlements in the Metropolitan Region of São Paulo. Responsible: Secretariat of Housing/ CDHU.
- Telemetry Network Integration with the Weather Radar of Ponte Nova Dam (Salesópolis/SP), for rainfall monitoring in conjunction with the Civil Defense. Responsible: DAEE.
- Training on Risk Perception and Assessment and Mapping of Risk Areas for municipal agents and technicians in the education and health sectors. Responsible: Cedec and Geological Institute.

Headwaters Program

The Headwaters Program was created in 2014 to promote the ecological restoration in priority areas, aiming for the protection and conservation of water resources and biodiversity. By articulating different restoration actors (Municipalities, NGO's, State Departments, and River Basins Committees, among others), the program seeks to connect specialists, landowners, entrepreneurs in the public and private sectors, and civil society organizations in an innovative approach to the public policy of restoration.

The Program is supported by a Management Committee, composed of 12 State Secretariats: Chief of Staff Office; Sanitation and Water Resources Secretariat; Agriculture and Supply Secretariat; Economic Development, Science, Technology and Innovation Secretariat; Public Security Secretariat; Planning and Management Secretariat; Penitentiary Administration Secretariat; Energy Secretariat; Education Secretariat; Department of Justice and Citizenship Protection; Environment Secretariat (which functions as the Executive Secretariat of the Program); and Government' Office (responsible for the coordination).

In 2017, the Program was reorganized by means of Decree nº 62,914, which simplified the program's understanding, formally established the Database of Areas Available for Restoration, excluded the standard-unit Tree-Equivalent (AEQ), and included two more instruments: the Computerized System to Support Ecological Restoration (SARE) and the conversion of fines. In addition, the SMA Resolution nº 157/2017 defines the requirements for the approval of "Shelf of Projects".

Among the instruments of the Program, Database of Areas Available for Restoration and the Shelf of Projects are worth mentioning.

The Database of Areas Available for Restoration aims at connecting, on the one hand, rural landowners and public area managers interested in enabling the ecological restoration and, on the other hand, holders of restoration commitments arising from environmental licensing requirements or from Environmental Infraction Reports, who do not have their own areas, as well as other parties interested in deploying voluntarily projects for the compensation of greenhouse gas emissions, enabling the restoration of areas important for the conservation of water and biodiversity. The Database of Areas Available for Restoration has a total of 132,850 hectares registered to receive restoration. 119 thousand hectares of those belong to private properties registered in the Rural Environmental Registry (CAR); 3,599 hectares are available for immediate restoration, and 13 thousand hectares come from settlements of the Foundation Institute of Land of the State of São Paulo (Itesp). The Database of Areas Available for Restoration (UCs), which started in 2016 with four UCs, is currently composed of seven UCs under management of the Forest Foundation (State Forest Edmundo Navarro de Andrade, Ecological Station of Ribeirão Preto, Ecological Station Barreiro Rico, Ecological Station of Jataí, State Park of Porto Ferreira, State Park "Assessoria de Reforma Agrária" and Ecological Station of Ibicatu), totaling 850 hectares available for restoration.

The Shelf of Projects is composed of the restoration projects approved by the Program Internal Commission, which can be hired by any party interested in promoting the restoration. These projects have a defined location and restoration strategy and the landowner's permission for their realization. The Commission is composed of representatives from Cetesb's Boards of Control and Environmental Licensing and of Environmental Impact Assessment, from the Coordination of Biodiversity and Natural Resources (CBRN) and from the Environmental Inspection (CFA) of the Secretariat for the Environment. Thus, the projects available on the shelf are apt to meet both the environmental licensing process for conversion of fines and voluntary initiatives. 2017 ended with 35 registered projects; 380 ha were committed and 1,000 ha remain available for contracts.

SMA Resolution nº 51/2016, which allows the conversion of administrative fines into environmental services, was complemented by the SMA Resolutions nº 138/2017 and 155/2017, in order to enable the consolidation of fines of several companies of a corporate group, thus contributing to conversions of greater amount and simplifying the administrative procedure. In 2017, a total of R$ 8.8 million Reals from Environmental Infraction Reports has been converted for the restoration of 176.16 ha.

The target set for March 2018 was reached in December 2017, with 7,200 ha in restoration. The next goal, established for December 2018, is 10,000 ha in restoration, and 12,000 ha for March 2019.

More information can be found at the electronic address <http://www2.ambiente.sp.gov.br/programanascentes/>.

Monitoring and Surveillance Programs for Biodiversity Conservation

The degradation of biodiversity resulting from acts and crimes against the environment is one of the main concerns of Environmental System of the State of São Paulo, as shown in section 3.3.5 of the previous chapter (Environmental Infractions: Risks and Threats to Biodiversity of São Paulo). To face this scenario, the attributions of the Coordination of Environmental Inspection (CFA) of the Secretariat for the Environment, together with the Environmental Military Police, are to plan, coordinate, monitor and implement the Monitoring Policy of the state of São Paulo, concentrating its efforts on two fronts of inter-related actions:

- **Inspection Management**: involves the implementation of structure and actions to bring efficiency and effectiveness to the conclusion of the administrative processes generated from each of the environmental infractions identified in the territory of Sao Paulo. It is mainly instrumentalized by means of the State Program for Environmental Conciliation, which has as its objectives: face-to-face conciliatory care to the citizen who received a fine; the orientation and rehabilitation of the offender in order to avoid possible recidivism and damages; the execution of penalties applied, including the payment of fines and, especially, securing the commitment for the regularization of his activities in accordance with the legal standards, or the repair of any environmental damage caused.
- **Inspection and Monitoring Strategic Actions**: directed to the protection of areas of relevance and importance for the conservation of the biodiversity in the state of São Paulo, as well as the themes listed as priorities. These actions are organized into thematic lines consolidated in the targets laid down in the Multiannual Plan 2016-2019 and in Specific Inspection and Monitoring Programs or Plans, articulated with other institutions and governmental agencies, or even with the civil society.

Inspection Management

State Program for Environmental Conciliation

To fulfill the procedures established in State Decree nº 60.342/2014 and in SMA Resolution nº 48/2014, the State Program for Environmental Conciliation[1]was created, being established by SMA Resolution nº 51/2014. The main objective of the Program is to guarantee the citizen a face-to-face conciliatory opportunity, designed to guide and negotiate the conclusion of the administrative proceedings concerning environmental infraction: The Environmental Care.

The Environmental Care is conducted with the presence of a technician of the Coordination of Environmental Inspection and an officer of the Environmental Military Police, meaning a first step towards the consolidation of the fines applied within the territory of Sao Paulo.

The permanent monitoring of the Program is carried out by means of surveys using statistical and analytical data, which guide the assessment of the Program's goals achievement and the decision-making process.

In 2017, 18,580 sessions of Environmental Care[2]were held, with an average rate of 76% attendance of citizens who had been fined and 65% of conciliation. Conciliation is considered achieved when the administrative proceedings concerning the environmental infraction are resolved in the session, during which the payment of the fine can be negotiated in installments and the commitment to repair the damage to the environment can be signed. Table 3.3 presents the general data of the State Program for Environmental Conciliation regarding 2017.

1 More information is available at: <http://www.ambiente.sp.gov.br/cfa/infracao-ambiental/conciliacao-ambiental/>.

2 The session occurs even without the presence of the offender, in order to consolidate the Environmental Infraction Report. Only one Environmental Session is planned to be conducted by infraction, but there are some exceptions when the need for complementary information concerning the environmental infraction is identified; for this reason, the total number of consolidated reports during the year differs from the total number of sessions of Environmental Care conducted.

TABLE 3.3

NUMBER OF SESSIONS, ATTENDANCE AND CONCILIATIONS REGISTERED IN THE STATE PROGRAM FOR ENVIRONMENTAL CONCILIATION IN 2017

	Sessions	Attendance		Conciliations	
2017	18,580	14,033	76%	9,156	65%

Source and preparation: SMA/CFA (2018d).

As results of the Program in 2017, the following can be highlighted:

- Participation of 6,559 (47%) of those who were fined in the 1st cycle of action for the rehabilitation of offenders, Legal Environmental Conduct.
- Training offered to the Reconciliation Agents by means of the course on Conflict Management, Culture of Peace and Non-Violence Principle, conducted by Senac at units distributed throughout the state, with the participation of 254 people, among technicians from the Secretariat for the Environment and officers of the Environmental Military Police.
- Completion of the Analytical Panel, by means of information gathered from the directors of the ten CFA's Regional Technical Centers of Inspection, with the objective of identifying the challenges and the needs for the improvement of infrastructure and the betterment of procedures regarding the Sessions for Environmental Care and the management of Infraction Reports.

Electronic Environmental Infraction Report (AIA-e) and the e-Ambiente Portal

In 2017, two initiatives were implemented for the modernization of the procedures regarding the Environmental Infraction Reports and administrative proceedings related to those: the Electronic Environmental Infraction Report (AIA-e) and the e-Ambiente Portal.

The AIA-e is a tool to optimize the use of human and material resources and to expedite infraction report processing since it is issued until its referral, in digital format, by means of the integration of the Operational System of the Military Police (SIOPM) to the Integrated System of Environmental Management (SIGAM) of SMA. The AIA-e works by means of a mobile data terminal (TMD), which gives access to Satellite images and to a data bank with information about the fauna and flora, allowing the police officer a greater precision and detail for the description of the violation and damage to the environment.

The e-Ambiente Portal was designed as a solution for the management of administrative proceedings in digital format, eliminating the use of paper documents and enabling greater agility in the assessment, processing and management of documents. As soon as the Environmental Infraction Report is filled by military police and migrates to SIGAM, a digital administrative proceeding is created in the e-Ambiente Portal, automating workflows and creating an opportunity for both the technicians of the Environmental System, and for the citizens who were fined, for the electronic visualization of documents.

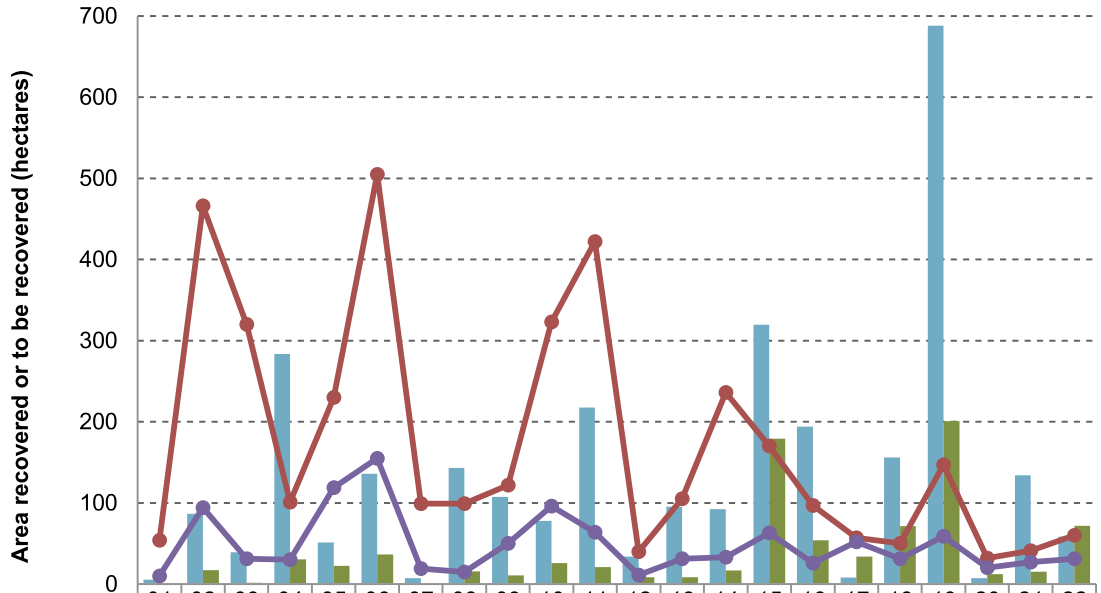
Repair of Environmental Damage

The commitment to repair the damages identified by means of the consolidation of the environmental infractions, resulting both from the Environmental Care Session and from the assessment of defenses and appeals presented by the citizen[3], is reached when the Term of Commitment to Environmental Recovery (TCRA) is signed. TCRA can contemplate the recovery, settlement or preventive measures.

In 2017, 3,776 TCRAs[4]were signed, which meant the commitment to recover an area of approximately 2,941 hectares, forecasting the planting of more than 630 thousand seedlings of native trees in the state of São Paulo. In relation to TCRAs fulfilled in 2017[5], an effective recovery of an area equivalent to more than 854 hectares in the territory of São Paulo was registered, with approximately 378 thousand seedlings of native trees being planted. The distribution of the commitment and recovered areas and the number of TCRAs signed and fulfilled by UGRHI is shown in Figure 3.3.

FIGURE 3.3

TOTAL AREA RECOVERED AND COMMITTED TO RECOVERY AND NUMBER OF TERMS OF COMMITMENT TO ENVIRONMENTAL RECOVERY SIGNED AND FULFILLED IN 2017 BY UGRHI



	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
Area to recover (ha)	5	86	39	284	51	136	7	143	108	78	218	34	95	92	320	194	8	156	688	7	134	59
Area recovered (ha)	1	17	2	30	22	36	0	16	11	26	21	8	9	17	179	54	34	71	201	12	15	72
TCRA's signed	54	466	320	101	230	505	99	99	122	323	422	40	105	236	170	97	57	50	147	32	41	60
TCRA's fulfilled	10	94	31	30	119	155	19	15	50	96	64	11	31	33	63	26	52	31	59	20	27	31

Source and preparation: SMA/CFA (2018e).

3 Considering the citizen's right to ample defense, some administrative proceedings concerning environmental infraction reports are only completed after the final decision about the appeals made by the citizen has been issued.

4 The deadline for each TCRA signed and fulfilled varies according to the complexity of the area to be recovered, spanning, as defined in the legislation, for at least 2 years.

5 The quantity and the percentage of TCRAs fulfilled in 2017 does not fall completely within the total number of terms signed in the same year. In 2017, TCRAs signed in previous years were also fulfilled. Likewise, TCRAs signed in that year should be completed over the following years.

Caipora Operation

Caipora Operation, held since 2015, aims at undertaking efforts to inspect areas in TCRAs related to Environmental Infraction Reports of the flora and involves technicians of the Secretariat for the Environment, in particular the Coordination of Environmental Inspection, and officers of the Environmental Military Police. In 2017, as a result of the operation, 1,693 TCRAs were inspected, verifying the fulfillment of 50% of the terms signed.

Conversion of Fines in Environmental Services

The Conversion of fines in Environmental Services was regulated by the SMA Resolution nº 51/2016, disciplining the ways and mechanisms to enable the conversion of simple administrative fines, related to Environmental Infraction Reports into environmental services.

Between January and December 2017, a total of more than R$ 5 million in fines was converted into environmental services. The converted resources were used for the restoration of approximately 99 hectares, according to data in Table 3.4 and Figure 3.4, which present the values converted and the area recovered per UGRHI.

TABLE 3.4

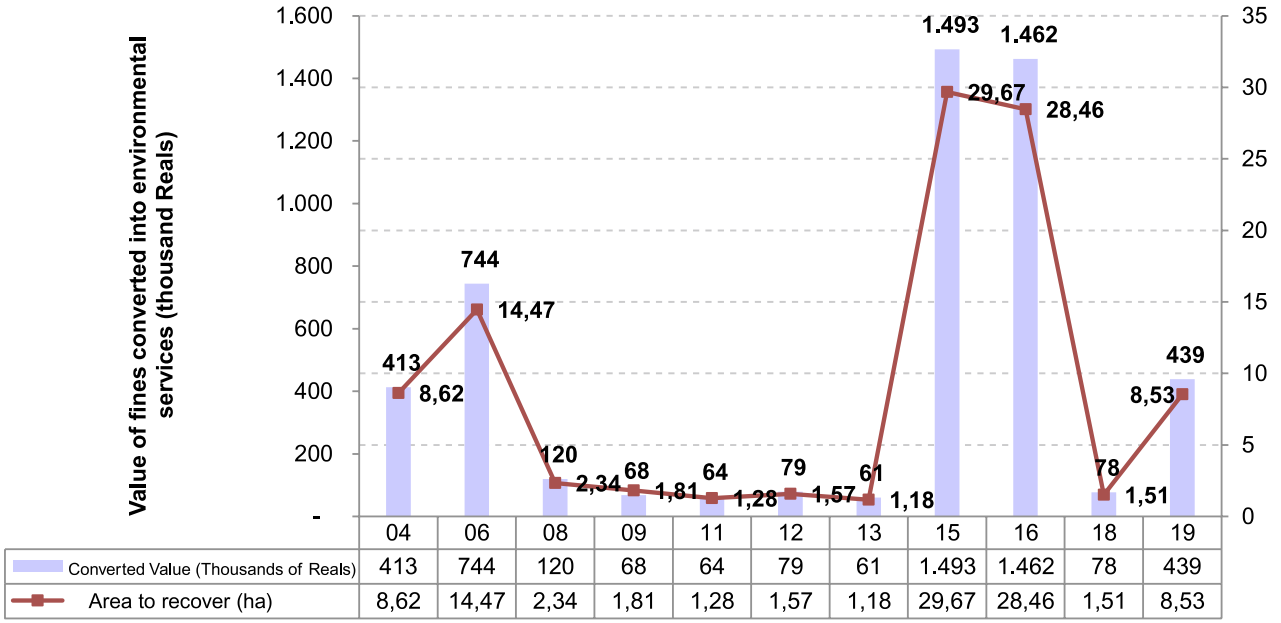
LIST OF UGRHI WITH VALUES OF FINES CONVERTED INTO ENVIRONMENTAL SERVICES AND TOTAL AREA COMMITTED TO RECOVERY IN 2017

UGRHI	Converted value (R$)	Area to be recovered (hectares)
01 – Mantiqueira	-	-
02 – Paraíba do Sul	-	-
03 – Litoral Norte	-	-
04 – Pardo	413,200.34	8.62
05 – Piracicaba/Capivari/Jundiaí	-	-
06 – Alto Tietê	743,580.00	14.47
07 – Baixada Santista	-	-
08 – Sapucaí/Grande	120,062.25	2.34
09 – Mogi-Guaçu	67,860.00	1.81
10 – Tietê/Sorocaba	-	-
11 – Ribeira de Iguape/Litoral Sul	64,179.20	1.28
12 – Baixo Pardo/Grande	78,627.90	1.57
13 – Tietê/Jacaré	60,534.00	1.18
14 – Alto Paranapanema	-	-
15 – Turvo/Grande	1,493,276.63	29.67
16 – Tietê/Batalha	1,462,488.08	28.46
17 – Médio Paranapanema	-	-
18 – São José dos Dourados	77,544.00	1.51
19 – Baixo Tietê	438,512.52	8.53
20 – Aguapeí	-	-
21 – Peixe	-	-
22 – Pontal do Paranapanema	-	-
State of São Paulo	**5,019,864.92**	**99.44**

Source and preparation: SMA/CFA (2018f).

FIGURE 3.4

TOTAL VALUES OF FINES CONVERTED INTO ENVIRONMENTAL SERVICES AND TOTAL AREA COMMITTED TO RECOVERY IN 2017 PER UGRHI



	04	06	08	09	11	12	13	15	16	18	19
Converted Value (Thousands of Reals)	413	744	120	68	64	79	61	1.493	1.462	78	439
Area to recover (ha)	8,62	14,47	2,34	1,81	1,28	1,57	1,18	29,67	28,46	1,51	8,53

Source and preparation: SMA/CFA (2018f).

[Translator's Note: (i) Converted Value (Thousands of Reals) / Area to recover (ha); (ii) in the graphic, read the comma as a dot and the dot as a comma.]

Still in 2017, in order to accelerate the recovery of degraded areas which were the object of fines by the Environmental Military Police, to invest in the implementation of ecological restoration projects, and to anticipate the restoration and rehabilitation of ecosystem services that provide well-being to the population, new devices for the conversion of fines into environmental services were created, by means of the publication of SMA Resolution nº 155/2017.

The new legal device allowed for all fines applied until the date of October 30, 2017 to be available for conversion, and the consolidated values to be applied to the financing of ecological restoration projects approved and made available[6] by the Headwaters Program.

A survey conducted by the Coordination for Environmental Inspection identified that 10% of the outstanding fines (not collected) are associated with inspections in the sugarcane sector. Thus, in a first effort to remedy this passive, intention protocols were signed between the Secretariat for the Environment (SMA) and institutions representing the sector: the Union of the Sugarcane Industry of the state of São Paulo (UNICA) and the Organization of Sugarcane Growers in the Middle-Southern Region of Brazil (Orplana). The conversions involving the sugarcane sector are expected to allow for the recovery of 500 hectares of native vegetation in the state, which is equivalent to the restoration of the riparian vegetation of 85 km of rivers.

Based on the protocols signed, the first conversion of the passive of fines related to the sugarcane sector was conducted in December 2017. A single company solved 17 fines, signed six TCRAs for the recovery of 37.7 hectares resulting from damage that occurred in the past, and also committed to finance the implementation of an ecological restoration project involving 7.67 hectares.

6 In situations in which the offender is the owner or lessee of rural property, he may submit a project himself, provided that there is no legal obligations of recovery of the degraded area or ecological restoration.

Inspection and Monitoring Strategic Actions

To prevent and repress environmental degradation is the primary objective of inspection and monitoring actions aimed for the protection and conservation of the biodiversity and natural resources of the state of São Paulo. The planning and implementation of these actions are carried out by means of a partnership between the Secretariat for the Environment, via the Coordination of Environmental Inspection and other departments, and the Secretariat of Public Security, via the Environmental Police Control, and are aimed for the conservation of protected areas and environmental assets such as fauna, forest remnants and products, fishing resources etc.

In 2017, as shown in Table 3.5, inspection efforts were registered as follows[7]: 29,249 inspection actions in rural properties and watershed areas; 218 trails and 233 inspections in fire outbreaks in Conservation Units; 2,255 actions for the inspection of wood; 4,318 actions for the inspection of breeders and breeding sites of wild animals; 519 inspection actions in sources of fishing consumption besides the investigation of 27,904 complaints[8] submitted to the Secretariat for the Environment and the Environmental Police Control by different departments and by citizens.

TABLE 3.5

INSPECTION ACTIONS IN 2017

Description of the inspection actions	No. of actions
Inspection of Rural Properties and Watershed Areas	29,249
Inspection in Conservation Units (trails and perimeter)	218
Inspection of Fire Outbreaks and Fires in Conservation Units	233
Wood Inspection	2,255
Inspection of Breeding Sites and Breeders of Wild Animals	4,318
Inspection of Fishery Consumption Sources	519
Investigation of Complaints	27,904

Source and preparation: SMA/CFA (2018g, 2018h).

Environmental Monitoring using Satellite Images (MAIS)

To enable the remote identification of illegal deforestation, seeking to curb the illegal suppression of native vegetation in the entire territory of the state of São Paulo, the Environmental Monitoring using Satellite Images[9] (MAIS) was developed. It is a methodology that uses resources from remote sources and geo-technologies to check the suppression of natural vegetation and other illegal interventions by comparing the most recent Satellite images possible with a database of older images[10].

The monitoring carried out using MAIS enables the identification of deforestation in areas greater than approximately 0.04 hectare (or the equivalent to a basketball court), subsidizing and complementing the inspection actions by the Environmental Military Police (PAmb).

7 It is important to clarify that the actions of inspection and monitoring in the state also involve other activities, but in this report only the specific strategies regarding issues considered a priority by the Environmental System of the state of São Paulo have been highlighted.

8 In 2017, the State Secretary for the Environment launched the APP and Portal "Denúncia Ambiente", in order to facilitate a channel for communication with the citizen to send information about possible environmental crimes and damage to the environment.

9 More information is available at: <http://www.ambiente.sp.gov.br/cfa/monitoramento/monitoramento-por-satelites-mais/>.

10 MAIS mainly uses images of: a) orthoimages prepared from aerial photos taken between 2010-2011 in the Cartographic Upgrade Project of the State of São Paulo (Projeto Mapeia SP), developed by the Company of Metropolitan Planning S/A (Emplasa); and (b) images generated by the satellite Sentinel 2A.

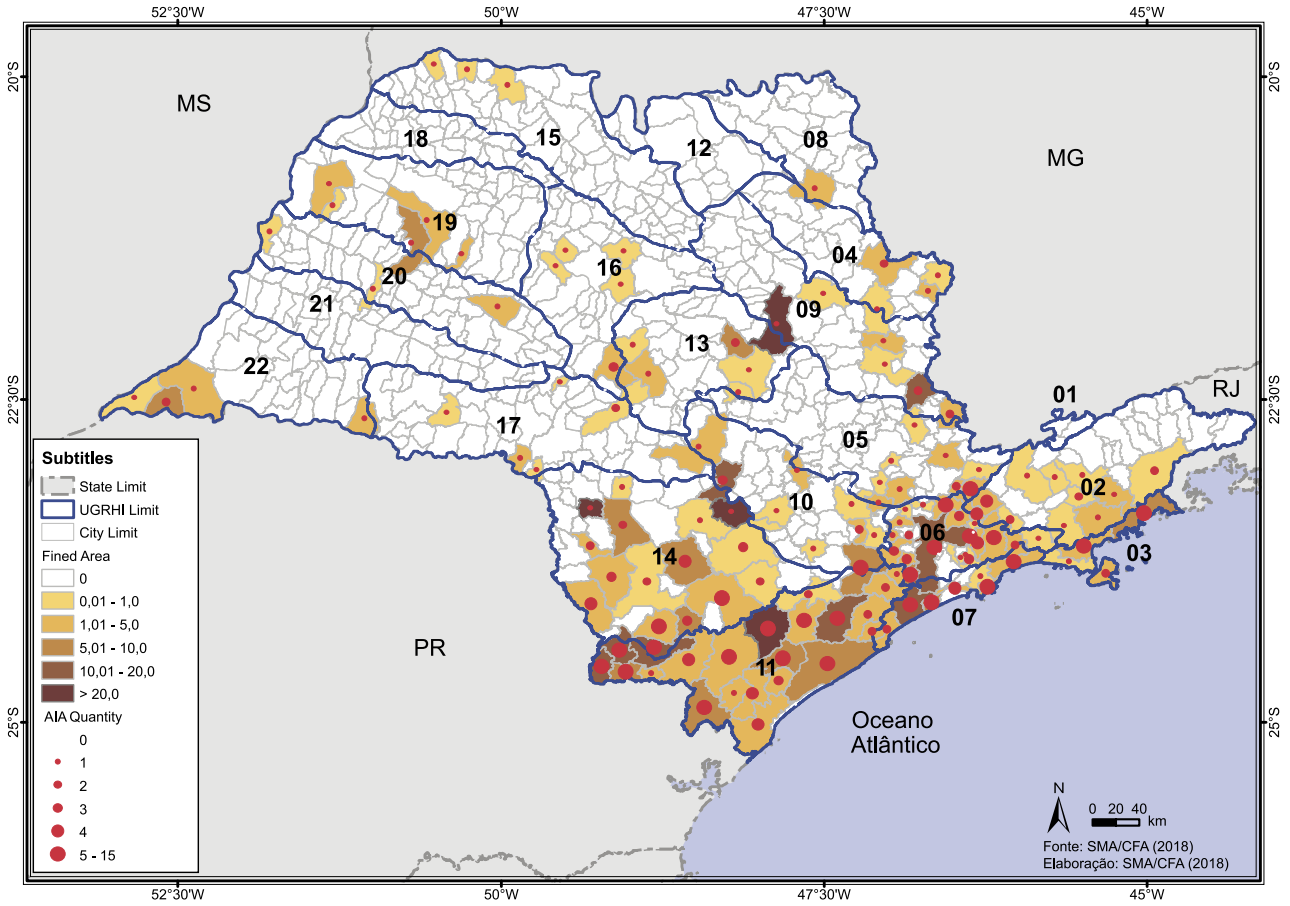
Improvement of MAIS methodology

In 2017, the acquisition of a portal of images with extreme spatial resolution, with pixel smaller than 0.60 m, allowed the expansion of MAIS to projects in which the detailing of the monitoring is important to contain the damage in areas under great pressure for urban expansion. These images were used for the construction of a new basis to compare images with dates between 2016 and 2017, reducing doubts and improving the quality of monitoring.

In 2017, every square kilometer of the state of São Paulo was monitored, on average, 2.9 times by MAIS[11]. Deforestation indicators recorded by MAIS gave rise to 407 Environmental Infraction Reports (AIAs), corresponding to approximately 658 hectares - or 6.58 km² - of vegetation removed illegally. The 407 inspections conducted in 2017 spread throughout 138 municipalities and Figure 3.5 illustrates their spatial distribution. The number of AIAs issued and the area fined, approximated by UGRHI, are presented in Table 3.6.

FIGURE 3.5

QUANTITY OF INSPECTION REPORTS AND EXTENSION OF THE AREAS FINED IN 2017 (BY CITY) BASED ON THE ENVIRONMENTAL MONITORING USING SATELLITE IMAGES (MAIS)



Source and preparation: SMA/CFA (2018i).

11 The number of monitoring actions carried out varies according to the availability and quality of the satellite images taken over the state.

TABLE 3.6

LIST OF UGRHI WITH FINED AREAS IDENTIFIED BY THE ENVIRONMENTAL MONITORING USING SATELLITE IMAGES (MAIS) IN 2017

UGRHI	No of AIAs	Fined Area (ha)
01 – Mantiqueira	-	-
02 – Paraíba do Sul	16	8.25
03 – Litoral Norte	24	11.71
04 – Pardo	05	4.38
05 – Piracicaba/Capivari/Jundiaí	18	12.39
06 – Alto Tietê	74	64.39
07 – Baixada Santista	32	29.44
08 – Sapucaí/Grande	01	4.72
09 – Mogi-Guaçu	07	14.77
10 – Tietê/Sorocaba	21	30.00
11 – Ribeira de Iguape/Litoral Sul	133	144.98
12 – Baixo Pardo/Grande	-	-
13 – Tietê/Jacaré	12	181.68
14 – Alto Paranapanema	40	111.79
15 – Turvo/Grande	03	0.63
16 – Tietê/Batalha	04	1.48
17 – Médio Paranapanema	04	2.46
18 – São José dos Dourados	-	-
19 – Baixo Tietê	05	19.74
20 – Aguapeí	03	3.57
21 – Peixe	-	-
22 – Pontal do Paranapanema	05	11.55

Source and preparation: SMA/CFA (2018i).

Integrated System for Conservation Unit Monitoring (SIM)

Considering that a significant part of the remaining native vegetation is inside protected areas, among which the Integral Protection Conservation Units is worth mentioning, the Integrated System for Conservation Unit Monitoring (SIM) was introduced to organize, coordinate, articulate and integrate actions of departments and entities of the direct, indirect and foundational administration whose activities are related to the protection, inspection and monitoring of these areas.

SIM meets the provisions of the State Decrees nº 58.526/2012, 57.933/2012 and 60.302/2014[12], with a focus on monitoring programs for legally protected areas and gathers the Environmental Inspection Plans regarding: Integral Protection Conservation Units (SIM-UC); Fishing Activities in Coastal Areas, which involves the Marine Environmental Protection Areas (SIMMar); and the Support Plan for the Protection of Private Reservations of Natural Heritage (SIM-RPPN).

12 Establishes the Information and Management System of Protected and of Environmental Interest Areas in the state of São Paulo (SIGAP).

SIM also includes the Socio-Environmental Training Program, which was developed within a preventive approach and in a partnership with the Center for Environmental Education (CEA) of the Secretariat for the Environment (SMA), and which seeks to involve all actors and communities that relate directly or indirectly to the territory of Conservation Units (UCs) by means of a training process aimed at mapping the environmental problems (its manifestations, effects and causes) and planning interventions that contribute to the reduction in the vectors of pressure.

Monitoring Plan for Integral Protection Conservation Units (SIM-UC)[13]

Established by means of the SMA Resolution nº 76/2012, the plan aims at integrating the operations between the components of the Environmental System of the state of São Paulo to ensure the attributes that justify protection of these areas, covering in particular the Units of Conservation in the Integral Protection category. 85 protected areas,[14]that cover a total of 981,749.56 hectares, are part of the Plan, as shown in Table 3.7.

TABLE 3.7

PROTECTED AREAS THAT COMPRISE THE INTEGRATED SYSTEM FOR INTEGRAL PROTECTION CONSERVATION UNIT MONITORING (SIM-UC)

Departments	Protected Areas	No of Existing Protected Areas	No of Monitored Protected Areas (SIM-UC)	Monitored Area (ha)
Forest Foundation	State Parks	32	30	941,836.80
	Ecological Stations	15	15	
	Natural Monuments	02	02	
	State Forests	02	02	
	Wildlife Sanctuaries	01	01	
	State Reservation	01	01	
	Environmental Protection Areas	30	01	
Forest Institute	Ecological Stations	10	10	37,940.76
	Experimental Stations	17	08	
	State Forests	10	07	
	Native Forest Park	01	01	
Botany Institute	Biological Reservations	02	02	1,326.00
	State Park	01	01	
Urban Parks Coordination	Parks	11	02	646.00
Total		**135**	**85**	**981,749.56**

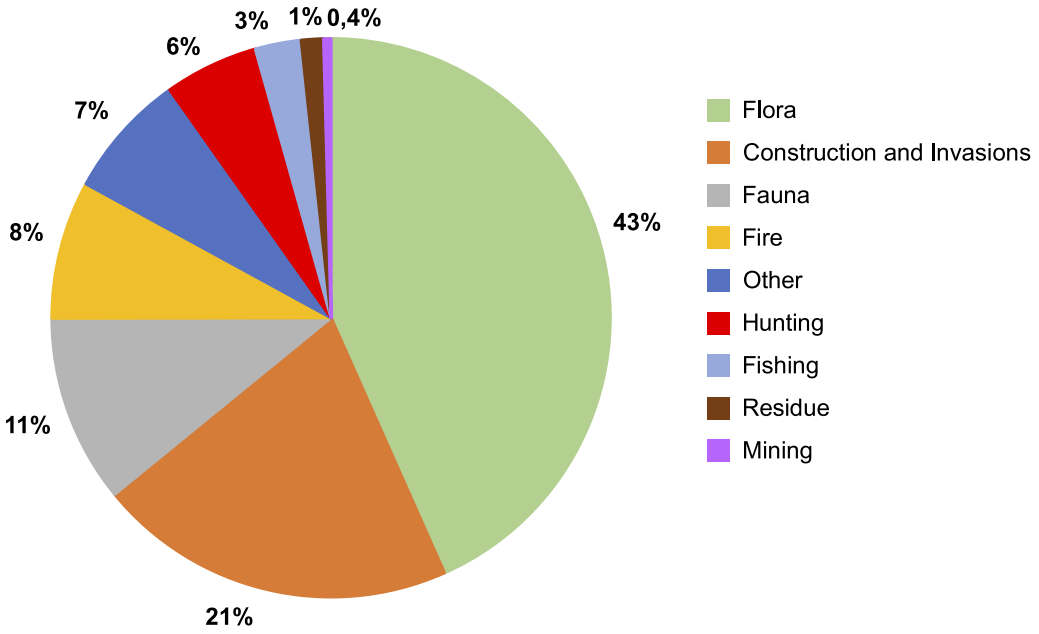
Source and preparation: SMA/CFA (2018j).

13 More information is available at: <http://www.ambiente.sp.gov.br/cfa/fiscalizacao/unidades-de-conservacao-sim/>.

14 Initially, the UCs of Integral Protection were integrated to the plan and, over the course of its deployment, some units of the Sustainable Use group were also strategically included, as well as some urban parks under the administration of the Center of Urban Parks (CPU) of the State Secretariat for the Environment (SMA).

In 2017, within the context of SIM-UC, a total of 6,675 inspection actions were conducted: 5,736 prevention actions and 939 actions regarding reported occurrences[15]. Among the reported occurrences those related to the flora (407 occurrences), construction work and invasions (195 occurrences), fauna (102 occurrences) and fires (75 occurrences) are worth mentioning, as shown in Figure 3.6.

FIGURE 3.6
TYPES OF OCCURRENCES IN PROTECTED AREAS IN 2017



Source and preparation: SMA/CFA (2018j).

Fishing Activities Inspection Plan in the Coastal Area and in the Marine Environmental Protection Areas (SIMMar)[16]

The coast of the state of São Paulo has approximately 860 km of extension and represents an area of approximately 2 million hectares, which corresponds to 8% of the entire territory of the state. Aiming at improving the supervision and extending the protection in this extensive stretch of coastline, the Integrated Marine Monitoring System (SIMMar), instituted by Resolution SMA nº 101/2013, articulates the work among the departments of Environmental System of the state of São Paulo to best ensure the attributes that justify the protection of coastal and marine biodiversity.

The areas of Marine Environmental Protection (APAs) of the Center, North and South; the State Park Laje de Santos, and the State Park of Ilha Anchieta integrate SIMMar, in addition to Conservation Units which have, within their boundaries or their Buffering Zones, areas of marine territory.

SIMMar is divided into three Operational Management Areas: Center Coast, Northern Coast and Southern Coast. Their function is to identify the main threats in their territory and direct the efforts for the planning and implementation of prevention and monitoring actions.

To evaluate the effectiveness of such actions, SIMMar has a monitoring system by means of which relevant information about the threats identified in the coastal areas, as well as the actions undertaken in the marine territory, are recorded and distributed.

15 Occurrences involve both environmental infractions recorded by the Environmental Military Police, and other damage or threats in which the offenders were not identified (the majority), such as the location of hunting, traps, fishing apparatus, signs of fire, mining or waste disposal, etc. These data are recorded in order to enable the identification of areas of vulnerability and the vectors of pressure on Protected Areas.

16 More information is available at: <http://www.ambiente.sp.gov.br/cfa/fiscalizacao/pesca-costeira/>.

Within the scope of preventive actions by SIMMar, the following are worth mentioning: the provision, since 2013, the Sustainable Fishing Map[17], with open access for the population as a whole about the areas with restrictions on various forms of fishing; information campaigns focusing on the protection seasons[18] of species such as shrimp and sardines; and the dissemination of guidelines about fishing modalities and restrictions or bans on fishing of species considered endangered or at risk (such as the ban on wreckfish fishing of until 2017, and on the grouper until 2023).

In 2017, there were 3,081 registered inspection actions aimed at preventing and curbing activities related to irregular marine fishing in the area of coverage of the SIMMar, and 189 Environmental Infraction Reports filed. The effort undertaken on the coast of São Paulo also resulted in seizures and apprehensions of irregular fishery products, boats and equipment. The distribution of the results of inspections per region is illustrated in Tables 3.8 and 3.9.

TABLE 3.8

INSPECTIONS OF THE INTEGRATED SYSTEM FOR MARINE MONITORING (SIMMAR) IN 2017

	Center Coast	Northern Coast	Southern Coast	Total
Inspection Actions	1,695	987	399	3,081
Environmental Infraction Report	82	68	39	189

Source: SMA/CFA (2018a) and PAmb (2018b), prepared by SMA/CFA (2018).

TABLE 3.9

SEIZURES CONDUCTED DURING INSPECTION ACTIONS OF THE INTEGRATED SYSTEM FOR MARINE MONITORING (SIMMAR) IN 2017

Seizures	Unity	Center Coast	Northern Coast	Southern Coast	Total
Fishery products					
Crab	Unity	690	-	-	690
Shrimp	Kg	2,860	50	1,656	4,566
Sardine	Kg	-	3,000	-	3,000
Fish and other fishery products	Kg	3,034	2,142	1,180	6,356
Boats and Equipment					
Means of Transportation: engine, boat, canoe etc.	Unity	03	-	04	07
Apparatus, fishing equipment and devices: spinner bait, trawl doors and drag fishing nets, fixed nets, castnets, hand landing nets, blue crab fishing nets, fishing floaters, etc.	Unity	60	26	53	139

Source: SMA/CFA (2018b) and PAmb (2018b), prepared by SMA/CFA (2018).

17 This tool can be accessed directly by DataGEO at the electronic address: <http://datageo.ambiente.sp.gov.br/>, as well as be used in geoprocessing programs and GPS receptors.

18 Period in which the hunting, gathering and sports fishing and trade activities are vetoed or controlled.

Support Plan for the Protection of Private Reservations of Natural Heritage (SIM-RPPN)

The Support Plan for the Protection of Private Reservations of Natural Heritage (SIM-RPPN), instituted by Resolution SMA nº 80/2015, is an initiative of the Environmental System of the state of São Paulo (CFA and FF) and the Environmental Military Police, in a partnership with the Federation of Private Ecological Reservations of the state of São Paulo (Frepesp).

Recognizing the importance of RPPNs in São Paulo for the conservation of biodiversity and ecosystem services, the plan supports the protection and conservation of biodiversity in these areas, fulfilling the targets of State Decree nº 51.150/2006. In the state of São Paulo, until the end of 2017, 91 RPPNs (Table 3.10) were created, totaling 21,205.43 hectares of protected private areas.

TABLE 3.10

OVERVIEW OF PRIVATE RESERVATIONS OF NATURAL HERITAGE CREATED IN THE STATE OF SÃO PAULO

Level	Individuals	Legal Person	Total No. of RPPNs	Area (ha)
State - Forest Foundation	27	16	43	16,810.36
Federal - Ibama/ICMBio	35	12	47	4,392.57
City - Secretariat for Green and the Environment of the City of São Paulo	-	01	01	2.5
Total	**62**	**29**	**91**	**21,205.43**

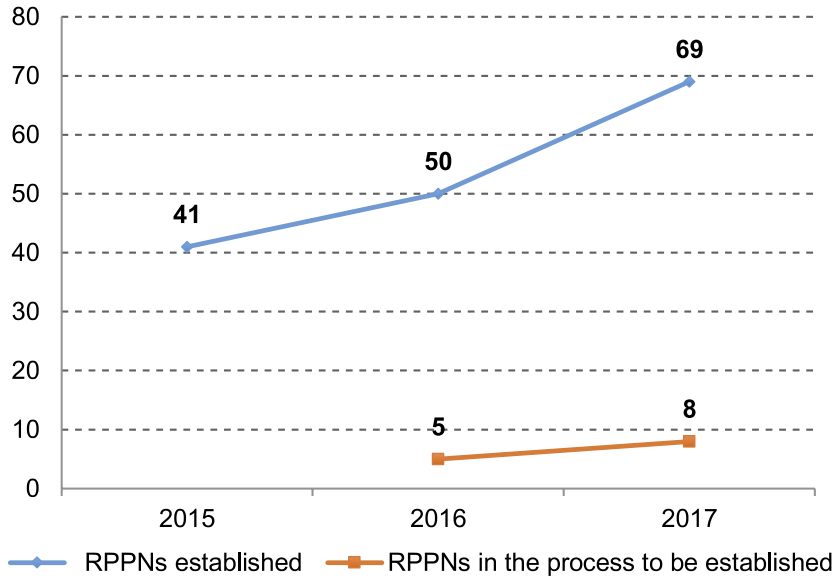
Source and preparation: SMA/CFA (2018j).

Among the strategies developed in the plan, the following are included: the establishment of a flow and channel of communication between the owners of the RPPNs and departments and control agents, support to curb threats to the reservations, and the survey and location of the main problems that interfere with or threaten the protection of their attributes, in order to subsidize the planning of preventive actions.

Until 2017, 69 RPPNs were involved in the plan, which corresponds to 76% of the reservations created in the state. As of 2016, RPPNs still being established were also invited to participate in the initiative, broadening the scope of SIM-RPPN, as illustrated in the graph in Figure 3.7.

FIGURE 3.7

PRIVATE RESERVATIONS OF NATURAL HERITAGE INVOLVED IN THE PLAN TO SUPPORT THE PROTECTION OF PRIVATE RESERVATIONS OF NATURAL HERITAGE (SIM-RPPN) UNTIL 2017

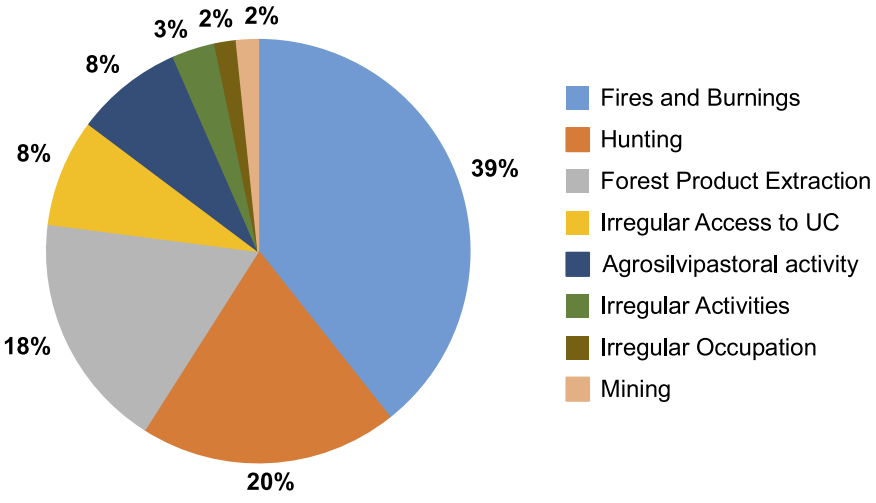


Source and preparation: SMA/CFA (2018j).

In 2017, SIM-RPPN actions focused on strengthening partnerships to support the management and protection of private reservations, considering the survey conducted with RPPNs' owners; 39% of those pointed out fires and burnings as the main threat to the conservation of these protected areas (Figure 3.8). Among the results of those actions, the following are worth mentioning: the workshop "Vectors of Pressure", conducted in a partnership with the WWF-Brazil and the Ecofuturo Institute, which discussed strategies for the reduction in pressures that threaten RPPNs; the articulation with the Cease Fire Operation, offering opportunities for the participation of RPPN owners and their teams in training for fire brigades, offered jointly by the Conservation Units of the state and the State Office of Civil Defense; and support in tackling major fire occurrences, as the one in Serra da Bocaina involving Catadupa RPPN, which demanded the engagement of the Military Police Air Group and mobilized the Fire Department, Forest Foundation and platoons of Environmental Police in the region.

FIGURE 3.8

MAJOR THREATS TO PRIVATE RESERVATIONS OF NATURAL HERITAGE



Source and preparation: SMA/CFA (2018j).

Socio-Environmental Training Program[19]

The Environmental Training Program (FS) aims at involving all actors of society, which relate directly and indirectly with the Conservation Units, in the formulation of responses to the complex issues which involve and, usually, motivate the inspection-related problems.

The Socio-Environmental Training is a fostering work aimed for the qualified participation in environmental management based on the inspection of Conservation Units. It is conducted at the UC Management Councils, in particular those involved in inspection plans under execution. The program consists of diagnosis, planning and monitoring actions of environmental inspections within and around the units. The purpose is to share concerns about threats to the protection of UCs with the various actors represented in the management councils, for a reflective work on the dynamics of the UC's territory and its surroundings, in order to subsidize the planning and implementation of interventions in the causes of environmental problems identified.

The implementation of the Program is organized in areas, composed of one or more UCs, managed by different agencies (including private reservations) at the federal, state and municipal levels, which, being next to each other, comprise the territories of influence of the UCs which are part of SIM. Between 2013 and 2016, a total of 47 Conservation Units were involved,[20]24 of which covered by SIM, and the other contemplated because of their relationship with the territory in the areas of Environmental Training.

In 2017, the actions of Socio-Environmental Training focused on unfolding work developed in Areas 12, 13 and 14 (Table 3.11), in order to strengthen initiatives to reduce pressures in the territories of the UCs.

TABLE 3.11

CONSERVATION UNITS CONTEMPLATED AND COVERED BY AREAS 12, 13 AND 14 OF ENVIRONMENTAL TRAINING

Area	Contemplated UCs	Inspection Problem Prioritized	Covered UCs
Area 12	Ecological Station Bananal	Vectors of pressure in UC's surroundings	Private Reservation Patrimônio Natural Santa Inêz
			Environmental Protection Area (city) Bananal
Area 13	State Park Cantareira	Land use and occupation within the Buffering Zone	State Park Alberto Löfgren
Area 14	State Park Intervales	Environmental degradation due to the extraction of Juçara heart of palm and hunting	National Forest of Capão Bonito
	State Park Nascentes do Alto Paranapanema		Environmental Protection Area Serra do Mar
	Tourist State Park Alto Ribeira		
	Ecological Station Xitué		
	State Park Carlos Botelho		

Source and preparation: SMA/CFA (2018k).

19 More information is available at the electronic address <http://www.ambiente.sp.gov.br/cfa/fiscalizacao/formacao-socioambiental/>.

20 Contemplated UCs mean those involved in SIM-UC or SIMMar and in whose Management Councils FS is developed. Covered UCs mean those which comprise the influence territories of contemplated UC's, within the idea of the FS area. These UCs covered UCs were represented by their managers and, in some cases, by members of the Councils. Work on contemplated UCs involved all or most of their counselors.

Three meetings were held at the Council of the Ecological Station Bananal (Area 12) in 2017, which involved the Coordination of Biodiversity and Natural Resources (CBRN), engaged to share its Agro-Ecological Transition and organic production agenda with social agents acting in the surroundings of UC. Because it is a common activity in the Buffering Zone of the Ecological Station, agriculture has the potential to exert great pressure on the UC. Hence, the demand for the Management Council agenda, organized with subsidies from the Environmental Training, to articulate policies that stimulate productive forms more suitable to the conservation territories. Another unfolding in Area 12 refers to the organization of tourist activity in the region, especially in the vicinity of the UC, because it is another activity that can exert great pressure on the unit. A work group was created to carry out this part of the Council agenda in conjunction with the Tourism Council, in order to influence the tourism policy in the municipality of Bananal.

In Area 13, as a result of Socio-Environmental Training held at State Park Cantareira, the City Administration of São Paulo, by means of the Decentralized Management Group North 2 of the Secretariat for Green and the Environment, in conjunction with CFA and CEA, developed the methodology to involve the Regional Council of the Environment, Sustainable Development and Culture of Peace ((CADES) with the reduction in pressures on the UC. Because there is overlapping between the Buffering Zone of the State Park Cantareira and the administrative territory of the Regional Administration of Casa Verde, Limão and Cachoeirinha neighborhoods, the work sought to address the relationship between the housing agenda and environmental concerns. During 2017, seven meetings of Environmental Training were held within CADES' meetings. As a result, an agenda of actions to tackle structural causes of pressures on the UC, significantly associated with the demand for housing and irregular occupations at the edges of the park, was built.

In the Paranapiacaba Mosaic (Area 14), the agenda was built by representatives of the Mosaic UC Councils, and aims at disseminating the processing and multiple use of the Jussara Palm Tree fruits, with strategies to reduce the pressures on this natural attribute protected by UCs in the region. In order to do so, the work group of Socio-Environmental Training within the Environmental System of the state of São Paulo aimed at contributing to strengthen this agenda, both by means of the articulation among the different managers of the Mosaic UCs and the region, and dissemination of this agenda in the event Mata Atlântica Fruits, held in October 2017.

State System for Forest Fire Prevention and Fire Fighting (Operação Corta Fogo)[21]

The state of São Paulo has the State System for Forest Fire Prevention and Fire Fighting, established in 2010, which aims at: reducing fire outbreaks in the state; reducing emissions of greenhouse gases (GHG) from burnings; protecting areas with vegetation coverage against fires; and eradicating illegal practice of fire use, respecting the provisions of State Decree nº 56.571/2010 and fostering the development of alternatives to fire use in agricultural, farming and forest management.

Operação Corta Fogo, as this system is called, is formed by several state agencies such as the State Office of Civil Defense (Cedec), the Fire Department, the Environmental Military Police (PAmb), the Environmental Sanitation Technology Company (Cetesb), the Forest Foundation (FF) and the Forest Institute (IF). The system coordination is carried out by the Secretariat for the Environment, by means of the Coordination of Environmental Inspection.

The system is composed of four integrated programs: Prevention, Control, Monitoring and Fighting.

Prevention Program: target at the development of actions to disseminate preventive measures and educate the population about the risks and damages caused by fires and burnings. In 2017, the development of a campaign in a partnership with 23 highway concessionaires to disseminate messages on fix and moving panels is worth mentioning. The objective was to warn about fire risk and inform emergency phones.

21 More information is available at: <http://www.ambiente.sp.gov.br/cortafogo/>.

Control Program: geared at regulating, monitoring and supervising fire use, as well as issuing licenses and authorizations for controlled burning[22]. The program involves Cetesb, as the body responsible for issuing licenses and authorizations, and the Environmental Military Police, by means of the **Plan for the Inspection of Burnings and Forest Fires**[23], which aims at curbing the illegal practice of burnings in agricultural, farming and forest areas, as well as promoting actions against the manufacture, transportation, trade and release of balloons.

Monitoring Program: periodically follows up on fire and burning outbreaks, as well as on weather conditions that favor an increased risk of fire to act in real time, sending alerts and providing subsidies to departments participating in Operação Corta Fogo.

Fire Fighting Program: targeted at planning, integrating and carrying out actions to fight forest fires, as well as providing training for the city and Conservation Unit brigades. Among the actions carried out in the Fire Fighting Program 2017, the following are worth mentioning:

- 3,017 people trained and 492 cities taking part in the training of brigades to fight vegetation fires[24].
- Hiring a specialized company for aerial combat using fixed-wing aircrafts for the regions of Araçatuba, Ribeirão Preto and São José do Rio Preto, which generated twenty-five actions and a total of 54 hours of flight.

Participation of municipalities in Operação Corta Fogo

The municipalities are considered, according to State Decree nº 56.571/2010, local departments of the State System for Forest Fire Prevention and Fire Fighting (Operação Corta Fogo), with competence to carry out forest fire prevention, control, inspection and fighting actions in their territory.

In order to integrate the local departments with the state institutions that compose the System, the Term of City Adhesion to Operação Corta Fogo was established. It is a voluntary commitment that municipalities assume, aiming at including forest fire prevention and fighting actions in the environmental planning and management of the territory under their jurisdiction. With this adherence, convergence between the public policies developed by the state and by municipalities becomes possible. The indicators of adherence status for 2017 were the following:

- 183 participating municipalities (28% of state municipalities), as shown in Figure 3.9;
- 169 municipalities with fire brigades to fight forest fires (92% of participating municipalities);
- 1,153 brigades to fight forest fires;
- 145 municipalities carried out actions to reduce forest fire risks (prevention campaigns, environmental education actions, firebreaks, etc.).

22 Employment of fire as a factor of production and management in agricultural, farming and forest activities and for scientific and technological research purposes in areas with previously defined limits and with the authorization of the competent environmental department.

23 The results of the inspection actions can be obtained in the chapter on environmental diagnosis in this report.

24 Trainings were conducted during the Regional Workshops for Risk Reduction - Drought, organized by the State Office of Civil Defense and on specific events held at the Conservation Units. In 2017, 14 workshops were held throughout the state of São Paulo, and four trainings were held in Conservation Units (State Park of Juquery, State Park of Campos do Jordão, State Park Vassununga and Ecological Station Bananal).

FIGURE 3.9

DISTRIBUTION OF MUNICIPALITIES THAT ADHERED TO OPERAÇÃO CORTA FOGO UNTIL DECEMBER 31, 2017

Source and preparation: SMA/CFA (2018l).

Protected Area Management Programs

Management Plan

In face of the considerable amount of time necessary to draft and adopt the Management Plans and the large number of UCs which still do not have this planning instrument, the Committee on Integration of Management Plans was constituted at the end of 2016 (Resolutions SMA nº 95/2016 and nº 93/2017), whose central goal was to establish guidelines and procedures for the preparation, review and implementation of management plans for the Conservation Units of the state. The Committee includes representatives of SMA's Coordination departments (CPLA, CBRN, CFA and CEA), the three research institutions (Forest Institute, Botany Institute and Geological Institute), in addition to the Forest Foundation and the Cetesb.

The proposal for the constitution of the Committee was based on a critical analysis of what was necessary to reorganize the work, in order to better utilize the knowledge accumulated by the technicians of the Environmental System of the state of São Paulo for the implementation of activities which were, until then, outsourced to external consultants. In addition, the development of a methodological roadmap for the preparation of Management Plans, which respected the characteristics of each category of Conservation Unit in order to build a management instrument that promotes the application of the rules regarding SNUC and the Information and Management System of Protected Areas (SIGAP), proved to be essential. The objective is to decrease the time for drafting and approval of these instruments, as well as to facilitate the implementation of its guidelines in the territory.

The roadmap is being built on the basis of the experience accumulated by the managing departments and on that acquired in the preparation of the 11 Management Plans that comprise the Pilot Project of the Committee's work: State Natural Monument (MONA) of Pedra Grande, State Forest (FE) of Guarulhos, State Park (PE) of Itaberaba, State Park (PE) Itapetinga, Ecological Station (EE) of itapeti, Environmental Protection Area (APA) Rio Battle and State Park (PE) Restinga de Bertioga, managedby the Forest Foundation; and EE Marília, EE Avare, EE Paranapanema and FE Pederneiras, managed by the Forest Institute.

Three phases were defined for each Management Plan: (i) preparation of the Plans and their approval, according to the current legislation; (ii) deployment of the Plans, by means of the implementation of programs and actions, and the respective monitoring thereof; and (iii) revision of the Plans (or adjustments), based on the monitoring carried out in the second phase.

The new proposal seeks to characterize the territory in a leaner manner, with the necessary information for its zoning and the definition of the programs, based on existing secondary data. For the preparation of the 11 Management Plans of the Pilot Project, only the technical field visits necessary to compile information deemed crucial by the Committee were carried out.

Zones, areas and sectors may be established regarding zoning. The number of Zones has been simplified, but the classification follows the same intervention gradient previously established (none, low, medium or high intervention), respecting the vocation of these territorial portions. The Areas include activities that will be carried out in smaller polygons, such as public use and administration, among others, and overlap Zones following the same permitted degrees of interventions. In the case of the Buffering Zone, it can be divided into Sectors in accordance with the specificities of UC and its surrounding region. The Areas can be modified at any time, by means of a simplified rite, different from the one required for the revision of the Management Plan.

The Management Programs correspond to the actions, activities and targets required to achieve the UC's objectives, in order to transform the reality identified in the Diagnosis stage into a desired situation. For the UC categories in the Pilot Project, the following Management Programs were defined: (1) Management and Recovery; (2) Public Use; (3) Socio-Environmental Interaction; (4) Protection and Inspection; (5) Sustainable Development; and (6) Research and Monitoring. In order to subsidize the implementation phase of the Management Plan, indicators and targets to monitor and assess the objectives of each Management Program have been defined.

The Work Group on Social Participation, created within the context of the Committee and managed by the Center for Environmental Education (CEA), to develop the Methodological Conception of Social Participation that will guide the Participatory Workshops, planning, coordination and evaluation of social participation in the process of preparation of the Management Plans.

In 2017, the diagnoses and preliminary zonings of the UCs that compose the Pilot Project were drawn up and the process of social participation of six UCs (PE Itaberaba, PE Itapetinga, FE Guarulhos, MONA Pedra Grande, EE Avare and EE Marilia) started, totaling 12 open workshops with the participation of 507 people: 325 in the workshops of the Forest Foundation UCs and 182 in the ones of the Forest Institute UCs, as shown in Table 3.12.

TABLE 3.12

TOTAL NUMBER OF PARTICIPATORY WORKSHOPS AND PARTICIPANTS FOR THE CONSERVATION UNITS MANAGED BY THE FOREST FOUNDATION AND BY THE FOREST INSTITUTE, WHICH OCCURRED IN 2017

FF Units	Workshop	Number of Participants
FE Guarulhos and PE Itaberaba	1st.	53
	2nd.	52
	3rd.	56
	Total	**161**
PE Itapetinga and MONA Pedra Grande	1st.	55
	2nd.	58
	3rd.	51
	Total	**164**
IF Units	**Workshop**	**Number of Participants**
EE Avaré	1st.	27
	2nd.	52
	3rd.	51
	Total	**130**
EE Marília	1st.	23
	2nd.	13
	3rd.	16
	Total	**52**

Source and preparation: FF (2018).

State Program to support the Private Reservations of Natural Heritage (RPPN Program of São Paulo)

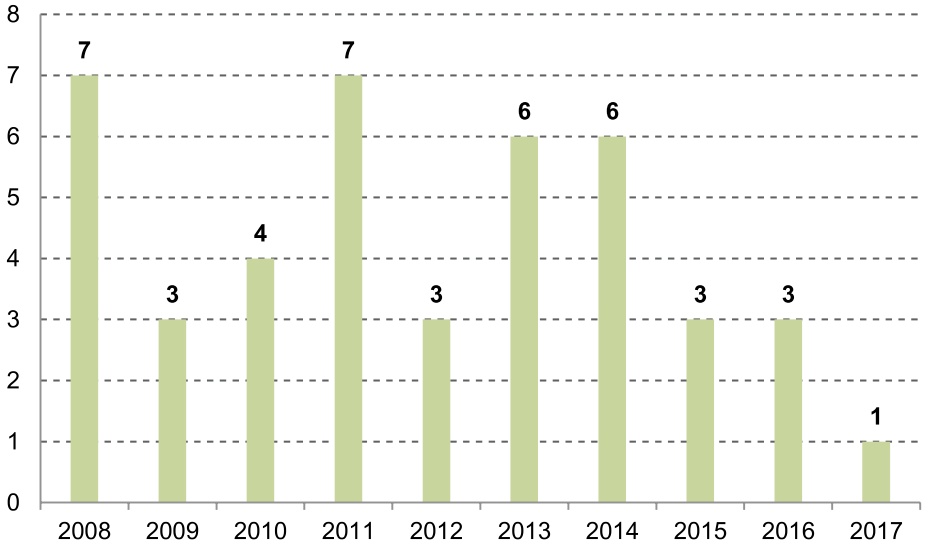
The State Program to support the Private Reservations of Natural Heritage (RPPN of São Paulo) was established in 2006, by means of State Decree nº 51.150, assigning the responsibility for its implementation to the Forest Foundation.

The program aims at stimulating the creation and implementation of RPPNs by: strengthening the associative organization of private reservation owners; conducting proper management before the competent departments at the federal, state and city levels, for the concession of credit and tax exemptions, and other tax incentives; fostering capacitation of owners; articulating and developing joint actions with the public departments that oversee the Environmental System of São Paulo; fostering technical and scientific support for monitoring and studies within the reservations; and encouraging and supporting the development of ecotourism activities and environmental education, as well as processes for RPPNs dissemination.

Since implementation until December 2017, 43 RPPNs were created, protecting 16,810.36 ha of forest remnants located in various regions inserted in the Mata Atlântica Forest and the Savannah biomes, as well as associated ecosystems. Figure 3.10 illustrates the total number of RPPNs created per year in the state of São Paulo between 2008 and 2017.

FIGURE 3.10

PRIVATE RESERVATIONS OF NATURAL HERITAGE CREATED IN THE STATE OF SÃO PAULO BETWEEN 2008 AND 2017



Source and preparation: FF (2018).

In 2013, the RPPN Program of São Paulo joined PSA/RPPN (Payment for Environmental Services provided to specific conservation of this category of Conservation Unit, within the Project Environmental Credit of São Paulo for RPPNs - CAP/RPPN), of the State Secretariat for the Environment and the Forest Foundation. Its primary purpose was to foster the legal protection of RPPNs' natural attributes, enabling financial return for proven services rendered for their conservation. Two project public notices are in force: the first with R$ 1,900.606.02 and the participation of 11 (eleven) RPPNs; and the second with R$ 789,373,52 and the participation of 8 (eight) RPPNs.

In 2015, another important achievement for the RPPN Program of São Paulo was the Plan for Support and Protection of RPPNs, established by Resolution SMA nº 80. This measure integrates the actions of the Integrated Monitoring System(SIM-RPPN), in order to implement the inspection system in the RPPNs, together with the Coordination of Environmental Inspection (CFA), with the Federation of Private Ecological Reservations of the state of São Paulo (Frepesp) and with the Environmental Police Control of the state of São Paulo. It also includes Operaçao Corta Fogo, with respect to the actions geared at forest fire fighting and prevention. Considering the potential risk and threat of fires to the protection of the areas preserved by RPPNs, it is necessary to incentive preventive actions and to strengthen local and institutional articulations so that actions in emergency cases may faster and be more effective.

Restoration Actions in Conservation Units

One of the attributions of the Forest Foundation (FF) is to contribute to the conservation, handling and management of the Conservation Units (CU), supporting, promoting and running integrated actions aimed for the protection of biodiversity, the sustainable development, the recovery of degraded areas and the reforestation of environmentally vulnerable sites by means of partnerships with government agencies and civil society institutions.

Considering the fulfillment of the objectives mentioned above, the Forest Foundation established the Program for Environmental Recovery in Conservation Units under its management by means of Decree FF/DE nº 265, dated 12/04/2017. The program's main objective is to contribute to the improvement of environmental quality at the UCs and to promote the restoration of ecological processes with social involvement.

In addition, FF has been promoting efforts to identify, elicit, map and define strategies for the restoration of areas within the UCs under its jurisdiction. Such areas, to the extent that they are apt in terms of documentation, are registered with the Headwater Program of the State Secretariat for the Environment, where external institutions and the private sector may present restoration projects and, with proper approval, run them.

In this scenario, in 2017, several actions (total planting, enrichment planting, exotic species management and reforested areas maintenance) geared at forest restoration were carried out in approximately 780 hectares, as shown in Table 3.13.

TABLE 3.13

FOREST RESTORATION ACTIONS CARRIED OUT IN 2017 WITHIN CONSERVATION UNITS MANAGED BY THE FOREST FOUNDATION

Units	Area (ha)	Actions
PE Serra do Mar/Santa Virgínia Unit	200.00	Total planting, enrichment planting and eradication of exotic species (Eucalyptus) with enrichment
PE Vassununga	13.10	Management of lianas, total and enrichment planting
PE of Rio Turvo - Capelinha 1 Section	72.00	Total and enrichment planting
PE of Rio Turvo - Capelinha 2 Section	50.00	Total Planting
PE of Rio Turvo - Rio Vermelho 1 Section	3.57	Total Planting
PE of Rio Turvo - Rio Vermelho 2 Section	10.00	Total and enrichment planting
PE do Rio Turvo - Cedro 1 Section	8.54	Total and enrichment planting
PE of Rio Turvo - Embratel 1	6.71	Total and enrichment planting
PE of Rio Turvo - Capelinha 3 Section	55.00	Total and enrichment planting
RDS Lavras	5.21	Total and enrichment planting
PE of Rio do Peixe	90.00	Planting - Restoration Project on a Large Scale using Green Manure
PE of Rio do Peixe	9.12	Conventional Planting
PE of Aguapeí	140.00	Total planting combined with green manure
PE of Aguapeí	100.00	Planting native seedlings at a 2 x 2.5 m spacing
PE Furnas do Bom Jesus	84.15	5.48 ha dedicated to planting and 78.70 ha to exotic species management

Source and preparation: FF (2018).

Mosaics of Protected Areas

Mosaics of Protected Areas are management and spatial planning instruments focused on the conservation of nature, as well as the Biosphere Reservations and ecological corridors.

Federal Law nº 9.985/2000, which established the National System of Conservation Units (SNUC), in its Article 26 provides that "where there is a set of Conservation Units, of different categories or not, close, juxtaposed or overlapped, and other public or private protected areas, forming a mosaic, the management of the set must be done in an integrated and participatory manner, considering their different conservation objectives, in order to reconcile the presence of biodiversity, the valorization of socio-diversity and the sustainable development in the regional context".

Mosaic focuses on the integrated management of protected areas and their Buffering Zones, and contributes directly to the territorial planning and enhancement of regional identity.

Based on Federal Decree nº 4.340/2002, for SNUC's regulation, this management instrument aims at reconciling, integrating and improving the activities developed in each Conservation Unit within the mosaic. Integration approaches may refer to the development of relationships with the population residing in the mosaic's region; access to the units; the supervision, monitoring and evaluation of Management Plans; scientific research activities; allocation of resources deriving from environmental compensation, as well as to matters regarding the uses on the borders between units.

The integrated management in mosaics is very appropriate, since the natural processes develop in dimensions that transcend the boundaries of the Conservation Units.

The dialog and joint efforts among managers and other social actors, who experience distinct, yet similar realities, to tackle difficulties allow for greater richness and effectiveness in understanding regional contexts and, consequently, in the actions carried out in a more just and participatory manner, including time and cost reduction.

Initially, the idea of a mosaic of Conservation Units was largely used in the Mata Atlântica Forest, as a strategy to leverage conservation actions in a very threatened biome, with small Conservation Units. In 2006, the vast majority of the mosaics recognized in the country was located in this biome.

The Forest Foundation is responsible for the management of three mosaics and participates in three other under federal administration. The mosaics managed by FF are located in the Ribeira Valley. They are:

- Conservation Units Jureia-Itatins Mosaic: created on April 8, 2013 by State Law nº 14.982, with a total area of 97,213 ha. It changed the category of EE Jureia-Itatins areas, introducing six Conservation Units: four Integral Protection units - PE Itinguçu, PE Prelade, Wildlife Refuge (RVS) Abrigo and Guaratitama, EE Jureia-Itatins and two of Sustainable Use Units - Sustainable Development Reservation (RDS) Barra do Una and RDS Despraiado.
- Mosaic of Conservation Units Jacupiranga (MOJAC): established on February 21, 2008 by State Law nº 12.810, composed by 14 Conservation Units: three State Parks (Caverna do Diabo, Rio Turvo and Lagamar of Cananeia), five Sustainable Development Reservations (Barreiro-Anhemas, Quilombos of Barra do Turvo, Pinheirinhos, Lavras and Itapanhapima), four Environmental Protection Areas (Planalto do Turvo, Cajati, Rio Pardinho and Rio Vermelho, and Quilombos of Medio Ribeira), and two Extraction Reservations (Ilha of Tumba and Taquari). MOJAC protects 243,885.15 hectares of Mata Atlantica Forest and associated ecosystems, such as sandbanks, mangrove forests and high altitude fields.
- Mosaic of Paranapiacaba: established on June 21, 2012 by State Decree nº 58.148, composed of five units: EE Xitué, and State Parks Intervales, Carlos Botelho, Turístico of Alto Ribeira (PETAR) and Headwaters of Paranapanema (PENAP), in addition to the APA portion of Serra do Mar, which comprises the municipalities of Eldorado, Sete Barras, Tapiraí, Juquiá, Ribeirão Grande and Capão Bonito.

The deployment of the mosaics is in progress, representing a great challenge for the Forest Foundation. The creation of the Commission for MOJAC's Conservation Unit Implementation, established by Resolution SMA nº 50/2016 and the constitution of the work group to prepare the proposal for an action plan at the Mosaic of Jureia-Itatins Conservation Units, in accordance with the SMA Resolution nº 62/2016, are worth mentioning.

Regarding the mosaics managed at the federal level, the FF participates in three of them: Mosaic of Bocaina (MMA Decree nº 349/2006), Mosaic of Mantiqueira (MMA Decree nº 351/2006), and Mosaic Lagamar (MMA Decree nº 150/2006).

Socio-Environmental Recovery Program of Serra do Mar and Mosaic Systems of Mata Atlântica Forest

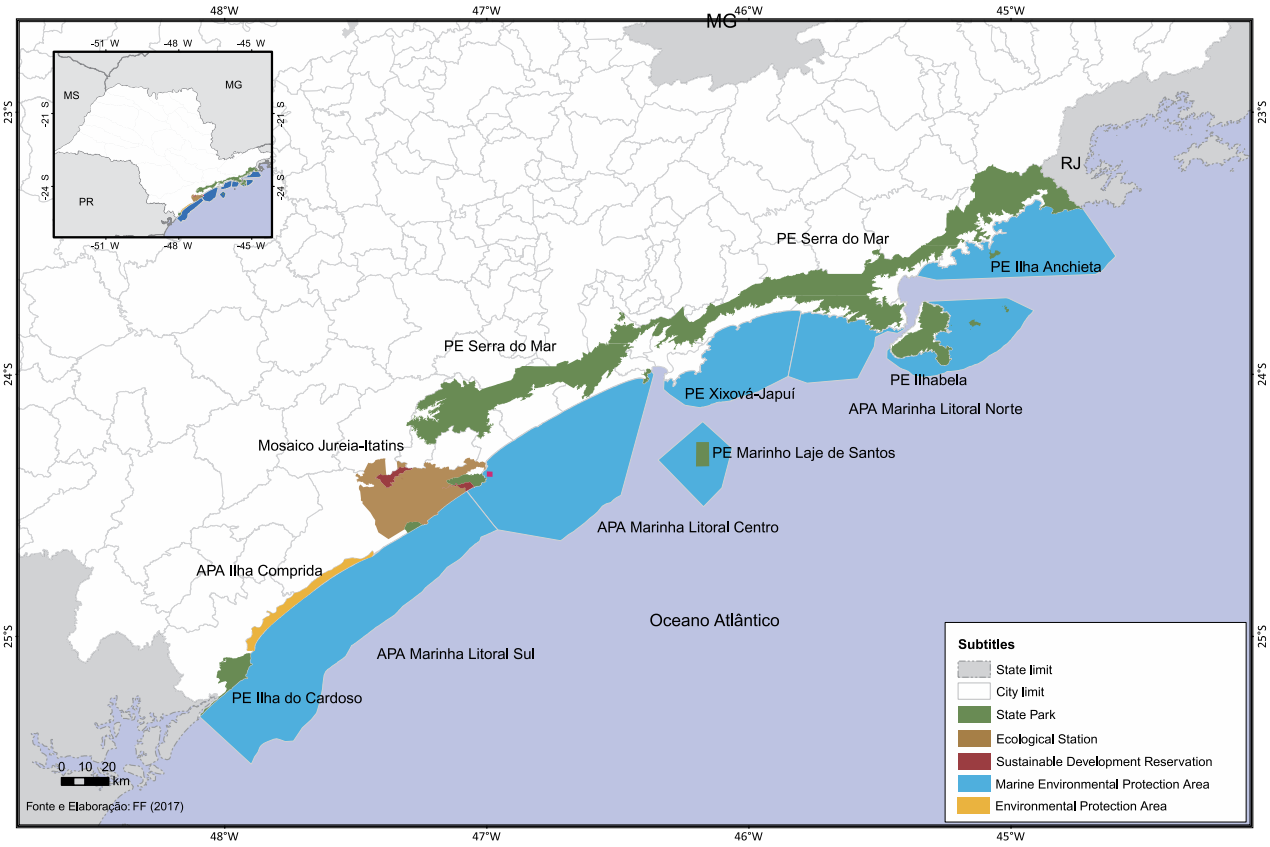
The program focuses on the conservation, sustainable use and environmental recovery within its coverage area. The intended outcome is to generate social benefits, relocating populations living in high-risk areas, inside and in the vicinity of PE Serra do Mar, and ecological benefits, restoring degraded areas, to promote the effective protection of biodiversity and of watershed areas that supply the metropolitan regions of São Paulo and Baixada Santista.

The main environmental actions developed in 2017 contemplated: the completion of construction work for adequacy and perdurability of Despraiado Road (16.3 km), which benefited the traditional community of Despraiado RDS/Jureia-Itatins Mosaic, composed of 35 (thirty-five) families, totaling 102 (one hundred and two) people; the completion of refurbishing work of PE Anchieta Island Píer; and the beginning of the maintenance services of buildings at Base Perequê/EE Jureia-Itatins.

In addition to these actions, it is worth to highlight the operational cost support for the 18 Conservation Units in the Program, strengthening management, protection and inspection actions by means of monitoring activities (22 environmental monitors); maintenance and supply contracts for vehicles and vessels, and maintenance and management of helicopter use in inspection actions within the territory of these Conservation Units. Figure 3.11 illustrates the coverage area of the Program.

FIGURE 3.11

COVERAGE AREA OF THE "SOCIO-ENVIRONMENTAL RECOVERY OF SERRA DO MAR AND MOSAIC SYSTEMS OF MATA ATLÂNTICA FOREST"



Source and preparation: FF (2018).

Forest Foundation Environmental Education Program

The Forest Foundation Environmental Education Program (PEA/FF), launched in 2016, aims at presenting guidelines and strategies for the fulfillment of its institutional mission in relation to environmental education actions, seeking to strengthen the identity of Conservation Units around a common conceptual pattern in environmental education, sharing responsibilities and seeking motivation within the team.

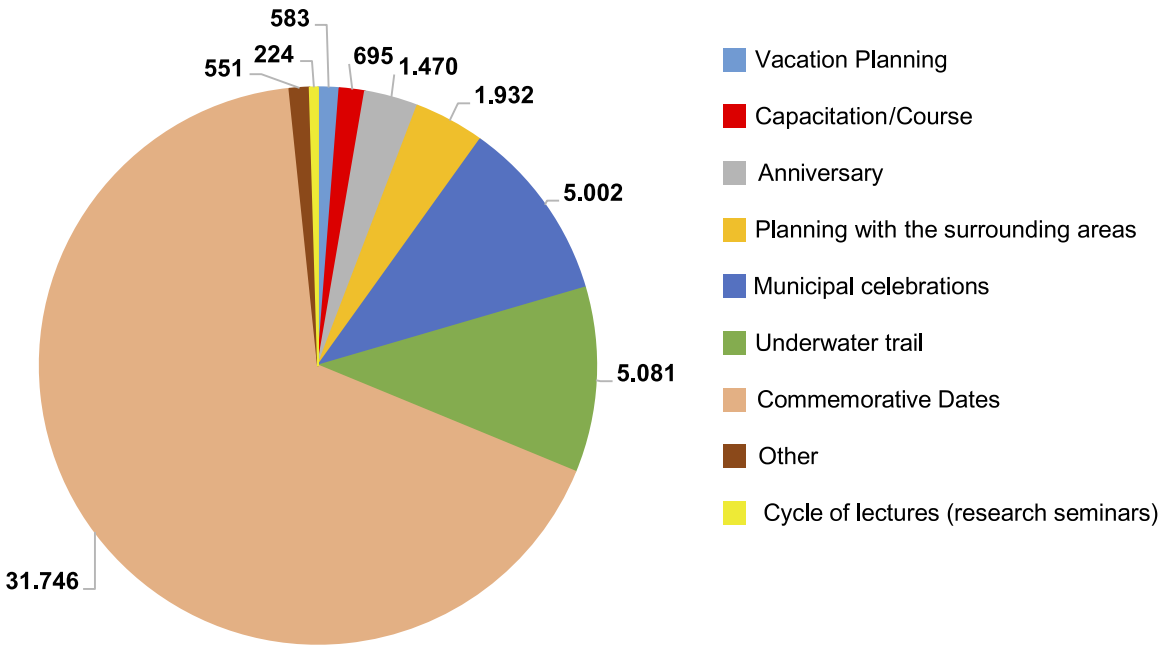
PEA/FF is integrated to other environmental education state public policies, strengthened by the creation of the Committee on Environmental Education Integration, established by Resolution SMA nº 33/2017, with representatives from all SMA's departments, to coordinate and monitor all actions, thus promoting the integration between projects and institutions. One of the results of this process was the Agreement between FF and CEA, signed in October 2017, to describe and promote the design, implementation and evaluation of environmental education activities that contribute to institutionalize PEA/FF as a policy for UCs' management.

This opportunity for dialog among sectors is also contributing to the collective and participative construction of actions and, in this sense, the PEA/FF is integrated to the Social Participation Work Group for the preparation of SMA's Management Plans. The group is composed by technical and research teams of FF, IE, and CFA and it is coordinated by CEA, as presented in the section "Management Plan".

Among the environmental education actions promoted by the UCs and guided by PEA/FF, are the service to different audiences, including students from public and private schools. In 2017, 57,117 students in 25 UCs received services by means of monitored roadmaps and trails, pedagogical projects, environmental studies, events and commemorative dates - all of which pre-scheduled with the schools.

The services regarding environmental education are conducted by environmental monitors, who also organize events and activities for thematic celebrations (commemorative dates), such as the Environment, Water and Children's Day, encouraging reflections focused on educational processes during these activities, such as awareness and mobilization for the conservation of these protected natural areas. The events also occur during the vacations and on celebrations marking the anniversary of the UCs, providing a greater contact between the local population and that of other regions, increasing the number of visitors and diversifying the environmental education activities. 47,284 people attended such events and Figure 3.12 shows that the commemorative dates enjoyed great prominence.

FIGURE 3.12
NUMBER OF PARTICIPANTS IN EVENTS HELD AT CONSERVATION UNITS IN 2017



Source: FF (2018), prepared by SMA/CPLA (2018).

The PEA/FF contributes to strengthen UCs as educational spheres; it is important, though, to structure the actions that are already being developed and propose new ones for their actual implementation, counting with the participation of various actors in a dialogical, articulated, collaborative, integrative and collective fashion, to reach the population as a measure of public policy. Therefore, the Environmental Education Programs of the Conservation Units go beyond the activities carried out, but consolidate as strategies of management of the UCs, both in planning and in monitoring and assessment, serving as instruments to measure results and make them efficient for management.

Ecological ICMS

The Tax on Transactions Regarding the Circulation of Goods and on interstate and intermunicipal Transportation Services and Communications Services (ICMS), provided for in the Federal Constitution, is a tax collected by the states and the Federal District; 25% of the total collected is transferred to the municipalities. In the state of São Paulo, the matter was initially treated in State Law nº 3.201/1981, with the definition of the calculation criteria of the Participation Index (IPM) to be applied to the total collected by means of the tax. Subsequently, State Law nº 8.510/1993 (as amended by State Law nº 12.810/2008) introduced protected areas as one of the criteria for IPM calculation - this criterion is commonly called "Ecological ICMS".

Law nº 8.510/1993 establishes that 0.5% of the fraction of 25% transferred to the cities of the state of São Paulo, of total collected by means of ICMS in the state, must go to municipalities with especially protected territorial spaces. The relevance of protected areas is established based on the level of restriction of use existing in these spaces. For the calculation of the Ecological ICMS amount, the following areas (state) are considered: Ecological Station, Biological Reservation, State Park, Environmental Protection Area (APA), Wildlife Zones within APA, Forest Reservation, Sustainable Development Reservation, Extractive Reservation, and Protected Natural Area.

The introduction of protected areas among the criteria to calculate IPM seeks to financially compenState municipalities for usage restrictions imposed by the establishment of legally protected areas in their territory.

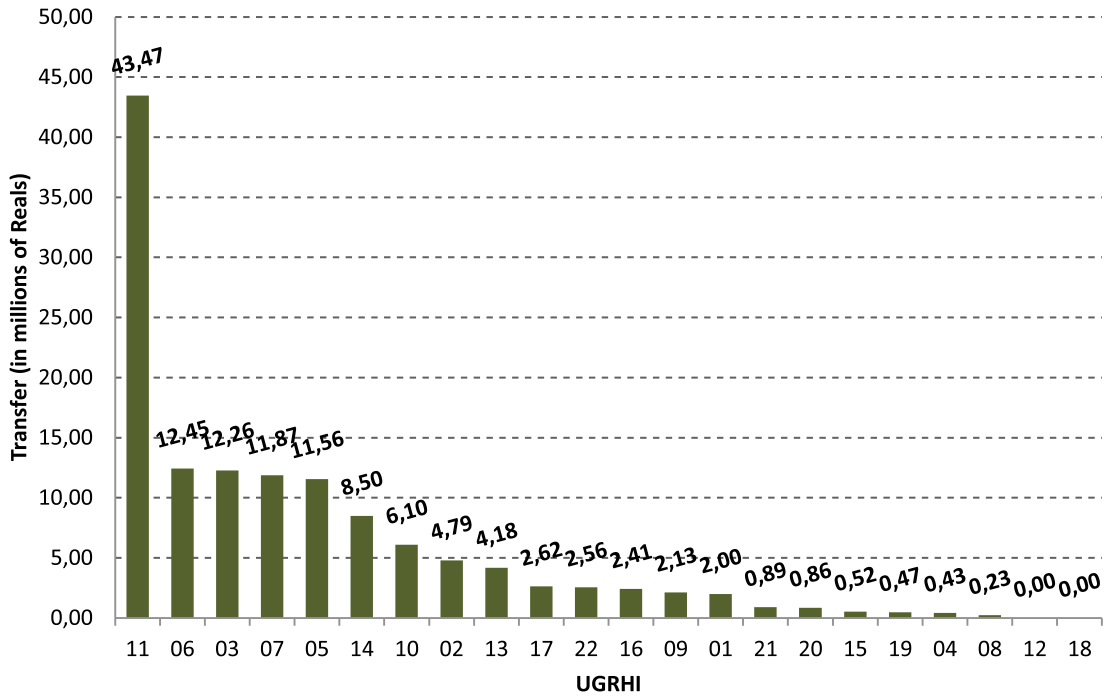
For 2017[25], the total amount regarding the Ecological ICMS transferred to the municipalities of São Paulo was R$ 130.29 million. Figure 3.13 shows the distribution of transfer operations per UGRHI regarding 2017.

Figure 3.14 shows the ten municipalities that received the most resources transferred from the Ecological ICMS in 2017, as well as the total amount received by each one. The city of Iguape deserves special emphasis, since it received approximately R$ 6.56 million. It is possible to observe that out of the 10 largest transfers, six were to municipalities of UGRHI 11 (Ribeira de Iguape/Litoral Sul).

25 The amounts transferrred in 2017 were calculated on the basis of the information about the economic activity of municipalities in 2015.

FIGURE 3.13

ESTIMATE OF THE ECOLOGICAL ICMS TRANSFERS PER UGRHI IN 2017

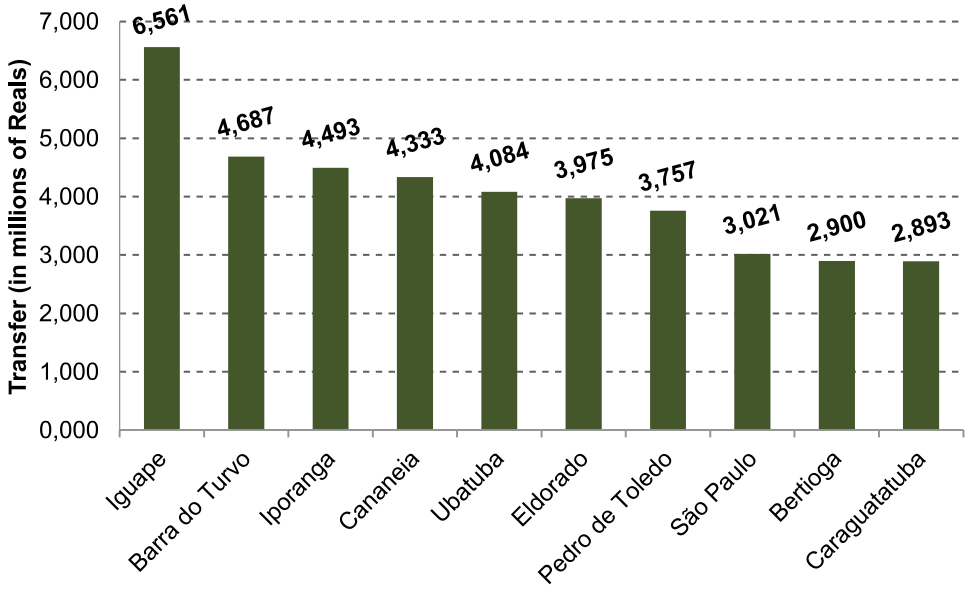


Source and preparation: SMA/CPLA (2018).

Note: in the graphic, read the comma as a dot

FIGURE 3.14

LARGEST ESTIMATED TRANSFERS FROM THE ECOLOGICAL ICMS TO MUNICIPALITIES OF SÃO PAULO IN 2017



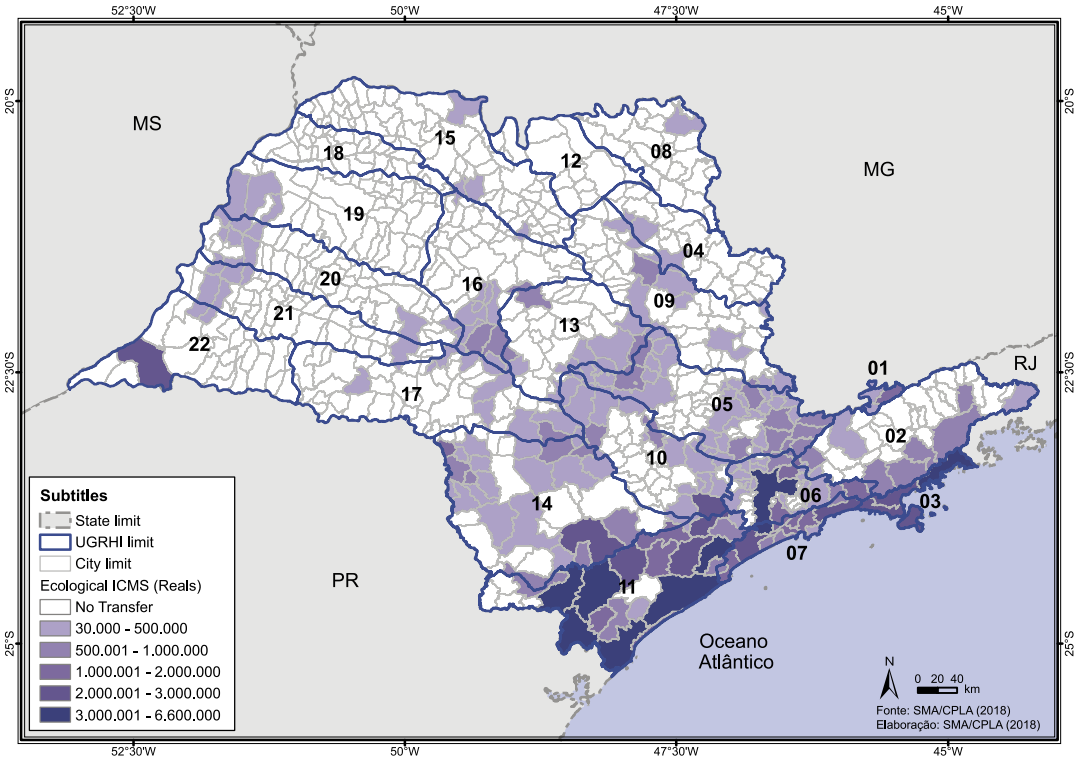
Source and preparation: SMA/CPLA (2018).

Note: in the graphic, read the comma as a dot

Figure 3.15 shows the spatial distribution of resources among the municipalities of the state in 2017.

FIGURE 3.15

DISTRIBUTION OF THE ECOLOGICAL ICMS TRANSFERS PER MUNICIPALITY IN 2017



Source and preparation: SMA/CPLA (2018).

Teaching and Research Programs at the Botany Institute

Research

The institutional mission of the Botany Institute (IBt) is to promote the development of scientific and technological research; the human resource training, and the management of biological reservations, collections and scientific collections, as a subsidy to the environmental public policies of the state of São Paulo.

In relation to research, 32 projects were being developed in 2017, divided into four Lines of Research: Biodiversity and Conservation (26), Climate Change (3), Bioprospection (1) and Water Resources (2). The results of various surveys conducted by IBt's technical body have been disclosed to the scientific community by means of a ample production: 147 scientific articles, 8 books, 40 chapters in books, 134 papers presented at scientific congresses, 2 manuals/bulletins, 24 graduate theses, 323 reports/technical opinions and 52 courses/lectures, totaling 730 publications and scientific-technical services.

The Institute manages 15 specialized laboratories, whose lines of research are: Wood anatomy; Biomonitoring of air pollution; Biochemistry of carbohydrates; Bioremediation of land and effluents; Ecophysiology of native species; Ecology of aquatic and terrestrial ecosystems; Environmental education; physiology of development; Phytochemistry and Bioprospecting; Floristic surveys; Environmental monitoring of aquatic and terrestrial ecosystems; Palynotaxonomy; Ecological restoration; Geoprocessing; Taxonomy of fungi, algae, bryophytes, vascular plants; Technology for the production of ornamental plants; Technology for the production of native orchids; and Physiology and Technology of seeds of native species.

IBt carries out the maintenance of the herbarium and the library collections, totaling 491,879 scientific collections. Herbarium Maria Eneyda Pacheco Kauffmann Fidalgo, from the Botany Institute, is the third largest in Brazil, and it is the most complete, since it is the only one that covers all taxonomic groups (algae, fungi, bryophytes, ferns, pine trees and plants with flowers). During the period, there was an increase of 13,891 samples at the herbarium and 519 volumes at the library. The process of computerization is in progress with 263,010 records available at the INCT "Herbário Virtual da Flora e dos Fungos": 172,642 registers of vascular plants, with the addition of 27,426 algae, 33,292 bryophytes and 25,589 fungi records (http://inct.splink.org.br). In addition, 26,930 images of herbarium specimens from the vascular plant collection can be found and accessed in the same site; of those, 4,824 correspond to images of nomenclature types. São Paulo's Herbarium is registered with the Council for Genetic Heritage Management (CGEN) as the Trustee of the Genetic Heritage Component Samples, which contributes to increase the importance and value of this collection.

By fulfilling its role in conservation programs of vegetable genetic resources, IBt maintains collections of living plants that are preserved for studies in the long term, together with information about their biology, place of collection, collector and environment in which they were collected. The collections are of great importance to serve scientific research, the conservation of biodiversity and the visiting public. Among them, there are living collections of: Orchids, approximately 750 species and 16,000 accesses (specimens); Bromeliads, with 160 species and 668 accesses (specimens); Cactus, with 344 individuals distributed in 28 species; Marantaceae, with 28 species and 98 accesses (specimens); in addition, there are cultures of Algae, Cyanobacteria and Fungi. These collections constitute important material for systematic studies, in addition to providing subsidies to utilization programs of native flora with ornamental and reintroduction potential in nature.

IBt is the manager of the Botanical Garden of São Paulo. With 36,000 m², the Botanical Garden has numerous attractions and beautiful trails, besides being a place of historical importance. The headwater of one of the streams that form Ipiranga Stream, the site of the declaration of independence of Brazil, is located In the Garden area. In addition, it is a very important area for the conservation of both native vegetation of Mata Atlântica, present in its surroundings, and of plants from various parts of Brazil and the world, cultivated within its coverage area. The Botanical Garden was the first in Brazil to be classified as category "A" by the

National Council of the Environment (Conama). This classification is largely due to the fact that the Garden is associated with a Research Institute and based on the tripod, Scientific Research, Environmental Education and Leisure. In 2018, the 90th anniversary of the Botanical Garden and the 80th anniversary of the Botany Institute are celebrated. The institution is part of the *Botanical Garden Conservation International* (BGCI), Coordination of the Global Strategy for the Conservation of Plants.

The Botanical Garden received 308,522 visitors in 2017, from all Brazilian states and from 51 different countries. Out of that total, 19,350 students came from 228 schools - 113 public schools and 115 private ones - from 94 municipalities in the state of São Paulo and 2 other states. 20 events were held at the site, among which the exhibits on orchids and bonsai and on cities and gardens; races and walks, and theater and choir presentations are worth mentioning. Interviews were also conducted with different media outlets, including television programs, with more than 110 interviews and reports talking about the Botanical Garden of São Paulo.

Teaching

The Botany Institute also has programs for top tier human resource education programs, such as the Graduate Program in Plant Biodiversity and the Environment, accredited by MEC/Capes - Level 5, which offers Master and Doctoral degrees, and internships in the Scientific Initiation Program (PIBIC - Institutional Program of Grants for Scientific Initiation - CNPq), whose quotas of study grants are managed by the institution itself, under the supervision of development agencies. The Institute also works in cooperation with universities; higher education institutions, and research, extension and technological development institutes, domestic and foreign ones, by means of its Capacitation Program in Botany and the Environment, according to State Decree nº 52.459/2007.

During the term of new coordinators, who took office in 2017, MEC/Capes level 5 grade was maintained for Capes' quadrennial evaluation; the training course on scientific writing in English for students and teachers, taught by Publicase professionals, was completed, and a photography contest, whose outcome will be an exhibit in commemoration of the 90th anniversary of the Botanical Garden and the 80th anniversary of the Botany Institute, was carried out.

In 2017, the course had 72 students, 41 teachers in 63 subjects, 29 scholarships for Master's degree and 40 for Doctoral Dissertations, funded by CNPq, Capes and Fapesp, moving more than one million seven hundred thousand Reals per year.

IBt's headquarters is located within State Park Fontes of Ipiranga (PEFI), in the capital of the state. In addition to its headquarters, the Botany Institute manages two other Conservation Units, representing the major biomes in the state: Mata Atlântica (Biological Reservation Alto da Serra de Paranapiacaba) and the Savannah (Biological Reservation of Mogi Guaçu), which are also used by teachers and undergraduate and graduate students from various universities in the state of São Paulo and Brazil, who develop their research in these areas.

The Biological Reservation of Mogi Guaçu, the one of Alto da Serra de Paranapiacaba and PEFI have 112 research projects and together received approximately 500 people/year for the development of didactic activities related to the environment, such as field classes, environmental education activities and trainings.

Sustainable Rural Development Project - Micro-Basins II - Market Access (PDRS)

The Sustainable Rural Development Project - Micro-Basins II - Market access is an action of the Government of the state of São Paulo, carried out by the Secretariat of Agriculture and Supply, by means of the Coordination of Integral Assistance (CATI) and by the Secretariat for the Environment, by means of the Coordination of Biodiversity and Natural Resources (CBRN). It is carried out with resources from the Government of the State of São Paulo, and the loan agreement signed with the World Bank, and with counterparts from municipalities and formal organizations of rural producers and of traditional communities (Table 3.14).

The goal of the Project is to increase competitiveness and provide market access to family farmers organized in associations and cooperatives throughout the state of São Paulo, as well as to organizations of producers in traditional communities such as indigenous and quilombo communities. The Project aims at increasing employment and income opportunities and promoting social inclusion and natural resources conservation.

SMA is responsible for the Environmental Sustainability subcomponent, which meets the objective of strengthening family farmers' competitiveness in the long run, promoting the sustainable management of natural resources for the production (soil, water and biodiversity), as well as contributing to the mitigation and/or adaptation to climate change. This subcomponent is based on three activities: (i) Environmental Management and Training in rural areas; (ii) Environmental Subprojects; and (iii) Payment for environmental services.

TABLE 3.14

PROJECT COST AND SOURCE OF RESOURCES (US$ 1,000)

Components and Subcomponents	The World Bank	State of São Paulo	Total
1 - Support to Family Farmers' Business Initiatives	37,110	20,641	57,751
1.1 - Investment in Family Farmers' Business Initiatives	32,000	13,000	45,000
1.2 - Strengthening Rural Producers' Organizations	5,110	7,641	12,751
2 - Strengthening Public Institutions and Infrastructure	36,990	25,180	62,170
2.1 - Public Policies, Market Monitoring and Rural Extension	9,990	6,504	16,494
2.2 - Strengthening Municipal Infrastructure	15,000	6,176	21,176
2.3 - Environmental Sustainability	12,000	12,500	24,500
3 - Project Management	3,900	6,179	10,079
Total	**78,000**	**52,000**	**130,000**

Source: SAA/SMA (2015), prepared by SMA/CPLA (2018).

Empowerment and mobilization actions involved courses, events, technical meetings and various publications, primarily to empower the target audience and the technical team of the project, disseminate the project's actions and results and to allow for experience exchanges.

The Environmental Subprojects activity, in its turn, contemplated technical and financial support for the deployment of projects targeted at productive activities, compatible with the environmental protection, to be developed by family farmers, in areas of particular interest or with environmental restrictions.

25 environmental subprojects were developed (Figure 3.16), involving 697 beneficiaries, by means of family farmers' cooperatives and associations and of Non-Governmental Organizations (NGOS) in the environmental area; 21 projects of those projects have developed Agroforest Systems (SAF), resulting in 600 hectares of implementation.

SAFs are an interest option for farmers in the state, since, in addition to being a sustainable productive activity, it also generates income for producers along with positive externalities, such as biodiversity conservation, greater availability of water and climate change effect mitigation.

PDRS invested in strengthening the organizations' management, either by means of infrastructure improvement or training. Technical training in agroforest systems was provided to farmers, as well as exchange programs to share experiences, resulting in the expansion of their production and commercialization capacity.

SAFs deployed have been under ongoing monitoring based on biophysical, socioeconomic and financial indicators, in order to generate a database and analyses to support the proposition and improvement of public policies.

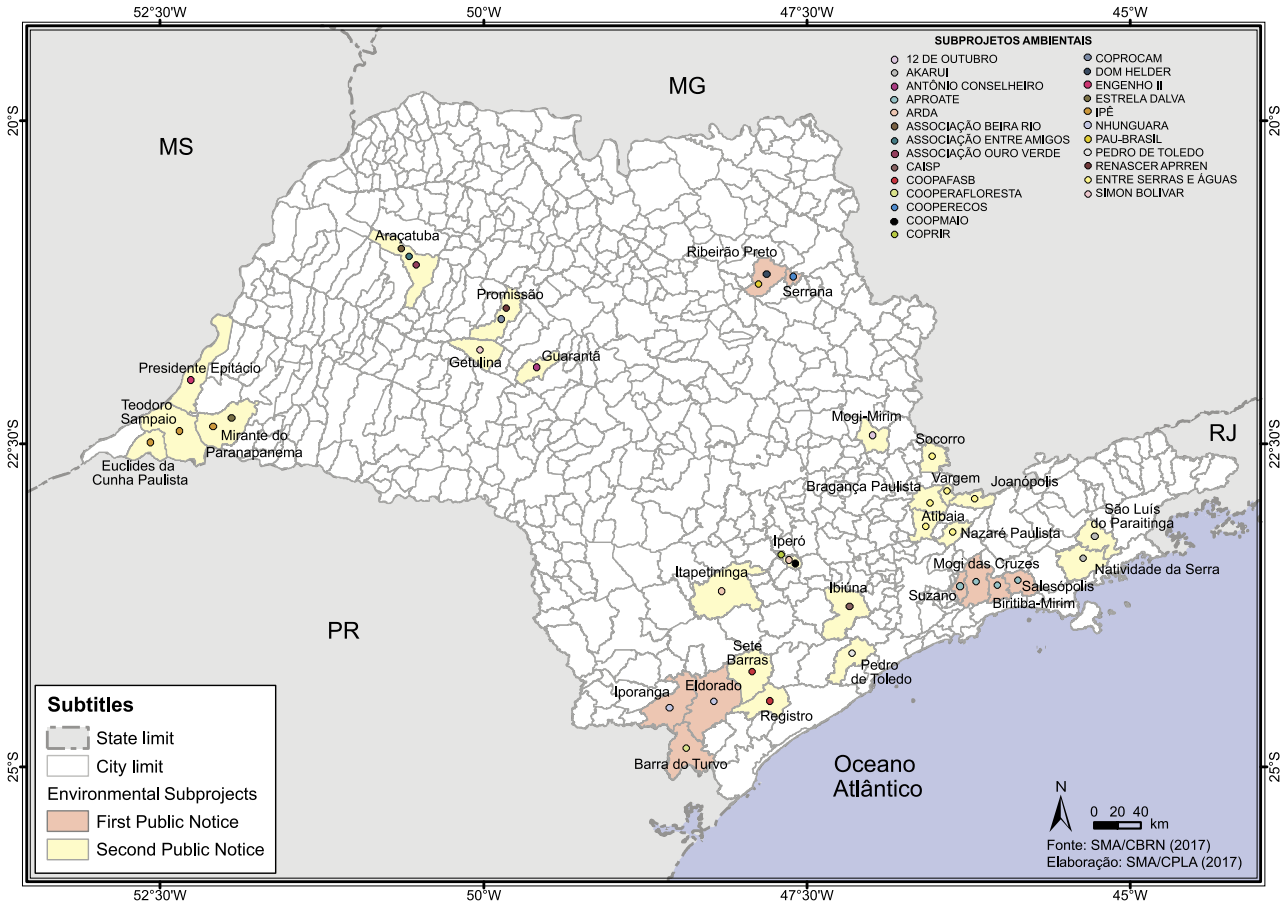
The initiatives of Payment for Environmental Services (PES) of PDRS aim at encouraging the protection and ecological restoration of headwaters, riparian vegetation and remnants of vegetation by means of economic grant.

Within the context of the Environmental Subcomponent, three PSA projects were developed: Mina D'Água Project, covering 900 hectares; Project Private Reservations of Natural Heritage (RPPN), contemplating the protection of 1,900 hectares; and in 2017, the first project public notice for the Riparian Vegetation Project was released.

PSA project public notices aimed at selecting rural farmers with areas of up to four fiscal modules to implement short-term actions for the protection of native vegetation, promoting the generation of ecosystem services such as the conservation of biodiversity and water. The rural producers can fence the areas of native vegetation, make firebreaks and use green manure.

FIGURE 3.16

ENVIRONMENTAL SUBPROJECTS



Source: SMA/CBRN (2018c), prepared by SMA/CPLA (2018).

Economics of Ecosystems and Biodiversity Project of São Paulo - TEEB-São Paulo

The Economics of Ecosystems and Biodiversity Project of São Paulo, called TEEB - São Paulo, was carried out as a subproject within the sphere of the Sustainable Rural Development Project (PDRS) - Micro-Basins II - Market Access. The project adopted the Economics of Ecosystems and Biodiversity approach, based on the premise of highlighting the economic benefits of biodiversity, as well as the growing socioeconomic cost of biodiversity loss and of ecosystems degradation and the risks they imply to society with the loss of the supply of ecosystem services provided by natural and semi-natural ecosystems. The project proposed to highlight this context to assist decision-makers in different government and market spheres to incorporate the ecosystem services into their planning.

The project's study area was the Basin of the Paraíba do Sul River, in the state of São Paulo. This area is characterized by large urban-rural heterogeneity, concentrating technological development poles and extensive rural areas. Despite the history of degradation and high degree of urbanization and industrialization in the region, it is in this part of the Basin that the greatest percentage of remnant vegetation of Mata Atlântica Forest and of Conservation Units (UCs) is concentrated. Such areas are mostly located at the top of Serra do Mar, since relief conditions are not favorable to agropastoral production (DEMANBORO, 2015). The predominant economic activity in the Basin are the pasture and rice production, which are inserted in a highly fragmented landscape, composed of different types of forest vegetation. In spite of occupying a large area of the Basin, the agricultural activities have low productivity, especially in the livestock, due to an inadequate use of management techniques and scarce access to credit. This scenario ends up generating negative externalities to the environment, thereby undermining the provision of Ecosystem Services.

Given this scenario, the project's objective was to propose public policies for the basin, reconciling the increase in productivity with the maintenance of ecosystem services.

Preliminarily, current use of the soil in the area and its projections for 2030 were mapped, considering the trends of various types of soil use: 1) if current trends remain - "Business as usual (BAU); 2) with the implementation of the new forest code - "Legal Compliance" (CL); 3) considering planning for the region - "Landscape Sustainable Management" (MSP), as shown in Figure 3.17.

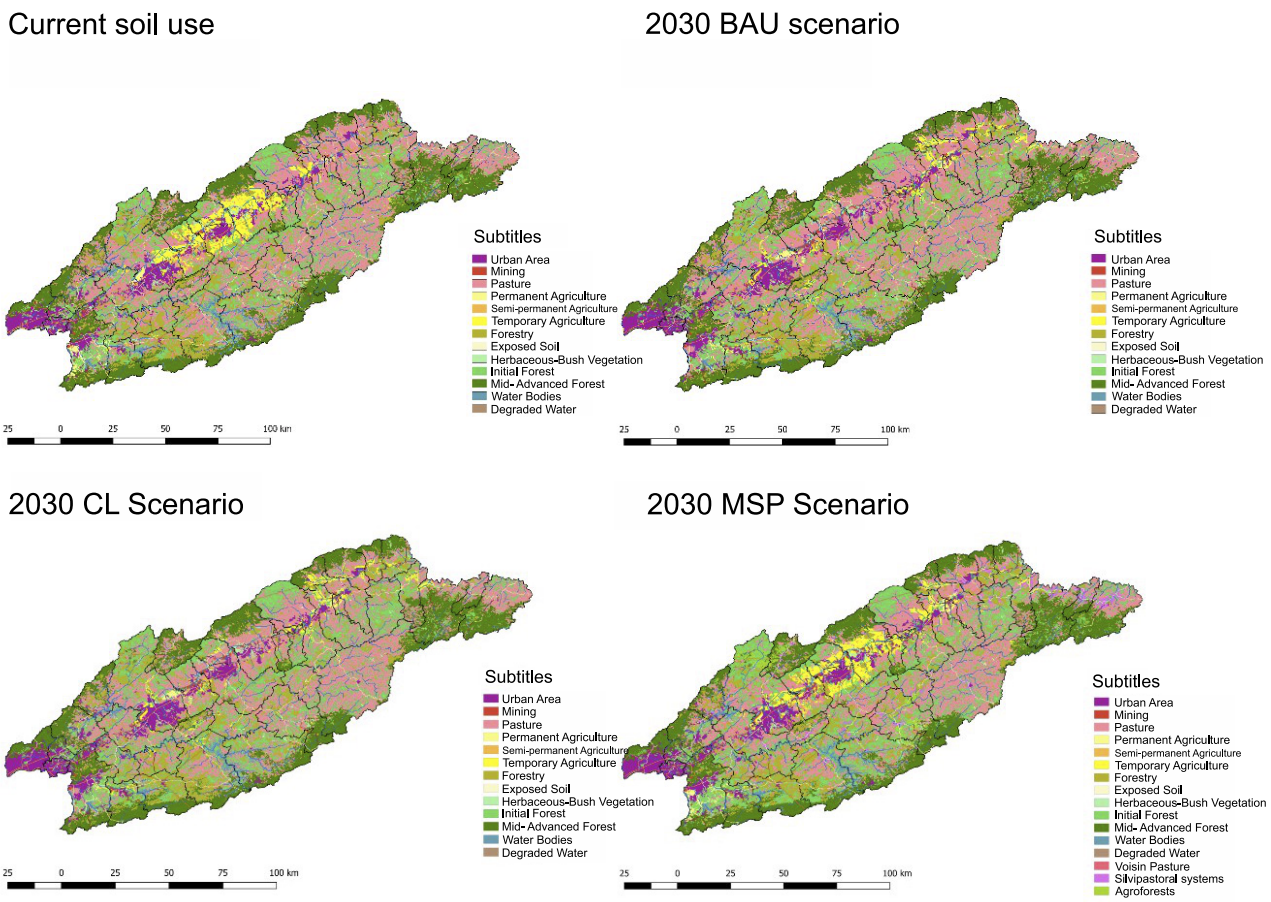
Based on the scenarios designed, biophysical assessments, and in some cases, economic assessments, of ecosystem services, were made: distribution and quality of water, carbon stocks, pollination, soil erosion control and availability of habitat for species. For each ecosystem service, a valuation method, when possible, and a model based on the economics of ecosystems were adopted:

- Water distribution and quality: the cost of water treatment and of dredging;
- Carbon Stocks: sum of carbon stored in different compartments; living biomass of the aerial part, living root biomass, dead organic matter (litter, tree trunks etc.) and carbon in the soil;
- Pollination: income from production vs. dependence of the culture per pollinator versus visitation potential;
- Erosion Control: sediment flow model;
- Availability of habitat for species: based on graph theory and dependent on the quality, size and connectivity.

Moreover, existing public policies were assessed for evaluation, and if necessary, the proposition of instruments to facilitate the implementation of sustainable development in the Basin.

FIGURE 3.17

SOIL USE MAPPING FOR THE PARAÍBA DO SUL RIVER BASIN, AND PROJECTIONS FOR 2030 IN THE SCENARIOS *BUSINESS AS USUAL* (BAU), LEGAL COMPLIANCE (CL) AND LANDSCAPE SUSTAINABLE MANAGEMENT (MSP)



Source and preparation: SMA/CBRN (2018d).

Table 3.15 shows the additional net present value (NPV) estimated for all ecosystem services examined.

TABLE 3.15

NET PRESENT VALUE (NPV) UNTIL 2035 FOR ALL ECOSYSTEM SERVICES CONSIDERED (IN R$) IN THE LEGAL COMPLIANCE (CL) AND LANDSCAPE SUSTAINABLE MANAGEMENT (MSP) SCENARIOS

Ecosystem Services		Scenarios			
		CL (R$)	MSP (R$)	CL (U$)	MSP (U$)
Climate Change Mitigation	Carbon Sequestration	181.127.154,00	203.328.796,00	48.538.744,31	54.488.375,83
Sediment	Avoided cost of water treatment (turbidity)	9.211.831,00	-29.886.382,00	2.468.601,20	-8.009.000,43
	Avoided cost of dredging	50.336.126,00	20.930.675,00	13.489.155,52	5.609.035,75
Pollination	Agricultural Gain	-	36.228.901,00	-	9.708.678,81
	Pollination Gain	15.435.323,00	31.265.450,00	4.136.382,54	8.378.565,28
Restauration	Opportunity Cost	291.164.068,00	-33.840.596,00	78.026.612,45	-9.068.657,02
	Restoration Cost	-126.300.485,00	-91.359.558,00	-33.846.205,90	-24.482.680,42
Total Net Gain		**-161.354.119,00**	**136.667.286,00**	**-43.239.934,78**	**36.624.317,80**

Dólar*	**R$ 3,7315995**

* Amount verified on 02/19/2019, based on the quotation of 02/18/2019. Source: Central Bank of Brazil.

Source and preparation: SMA/CBRN (2018d).

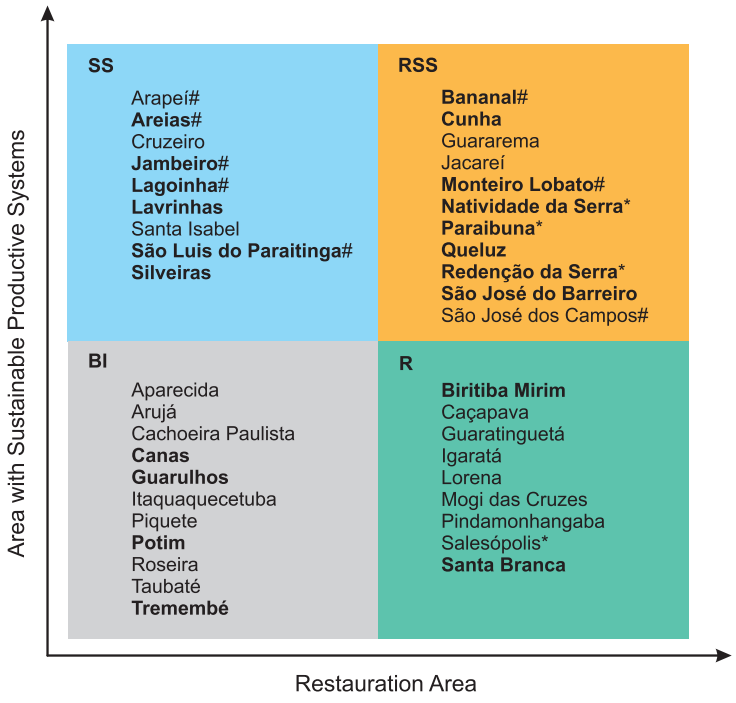
Overall, the results indicate an economic gain greater under the MSP scenario, when compared to the CL scenario. Under the MSP scenario, the estimated agricultural production was greater with lower estimated rates of CO_2 emissions, a reduction in the cost of water treatment and of river dredging, and in soil loss. In addition, there was an increase in pollination, indicating a greater economic gain; as a result of the reduction in pasture area due to a vertical increase in production, areas for restoration and space for other productive chains were freed up under this scenario. The increment in habitat was not economically valuated, but the connectivity of the landscape is higher under the MSP scenario, which can ensure biodiversity maintenance in the basin, considering that landscape connectivity is essential to the persistence of populations, due to dynamic processes such as recolonization, dispersion and seasonal migration (THISCHENDORF; FAHRIG 2000).

Within the context of public policy propositions for the transition to an ideal scenario (Landscape Sustainable Management), with greater provision of Ecosystem Services, more sustainable and with more socio-environmental and economic benefits, the project surveyed and analyzed 355 initiatives among laws, projects and programs at the state (54 actions) and municipal (301 actions) levels.

In addition, a ranking of the municipalities of the basin was prepared, grouping them in terms of their feasibility to develop priority actions for restoration and sustainable systems. The 40 municipalities of the basin were organized in terms of the absolute area to be restored. Then, they were divided into two groups, one with the 20 municipalities where the largest restoration areas were projected under the MSP scenario, and another group with the other 20 municipalities. Then, the same procedure was followed for the sustainable system areas (agroforest systems - SAFs, *voisin* and silvipastoral systems). Combining these two classifications, the municipalities were categorized into four groups: a) Restoration + Sustainable Systems (RSS) - Municipalities where the greatest changes of land use related to the restoration and expansion of sustainable systems should occur; b) Sustainable Systems (SS) - municipalities where mainly the expansion of sustainable systems should occur; (c) Restoration (R) - municipalities where mainly restoration should occur; and d) Low Intervention (BI) - municipalities where no large changes in land use under the MASP scenario were projected, as shown in Figure 3.18.

FIGURE 3.18

CLASSIFICATION OF MUNICIPALITIES IN TERMS OF THE FEASIBILITY TO DEVELOP PRIORITY ACTIONS FOR RESTORATION AND SUSTAINABLE SYSTEMS



Source and preparation: SMA/CBRN (2018d).

Note: The names in bold indicate the municipalities classified as 'low management" in the Program Municipality Green Blue; the asterisks (*) indicate the municipalities that have more than 5% of their area targeted for restoration, and the symbol (#) indicates the municipalities that have more than 5% of their area targeted at the expansion of sustainable productive systems.

Considering the above, it was possible to observe that land and use planning (restoration, in particular), compliance with environmental legislation and initiatives that encourage the replacement of conventional systems for sustainable systems such as agroforest ones, *voisin* and agrossilvipastorals are effective strategies to increase the delivery of ecosystem services in the basin.

For the CL and MSP scenarios, the majority of ecosystem services considered was better when compared to the baseline scenario BAU. The lowest values of soil loss under the CL and MSP scenarios emphasized that the adoption of new managements is crucial in initiatives that aim for the promotion of sustainable production systems and/or the restoration of ecosystems and ecological processes. The estimated carbon sequestration was 1.5 times greater under CL and MSP scenarios compared to BAU.

The RL APPs and the inclusion of policies that will stimulate restoration actions in the region are also essential for the maintenance of the pollination ecosystem service. Under the BAU scenario, lower values for the bees' visitation index were observed due to the greater distance between the cultivated areas and habitat areas.

The biophysical and economic assessments of ecosystem services are important tools to be considered in the planning for the Basin. The combined interventions under the MSP scenario, the compliance with the Forest Code, the spatial prioritization of restoration, the increase in agricultural production and the inclusion of improved systems (such as *voisin*, SAF's and agrossilvipastorals), are economically viable and should increase the provision of ecosystem services in the Basin in the period analyzed.

Agro-environmental Protocols

Environmental Protocol for the Sugarcane Sector

In its 10 years of duration, the Agro-environmental Protocol has accumulated a series of environmental gains that have brought more sustainability for the sugarcane sector in São Paulo. The following gains must be highlighted:

Reducing sugarcane burning

Since the beginning of the Agro-environmental Protocol, there has been a reduction of more than 97% in the area of sugarcane burnings authorized in the state, thus avoiding the emission of more than 9.91 million tons of CO_2eq (equivalent to the total emissions of about 173 thousand buses in circulation during 1 year) and more than 59 million tons of atmospheric pollutants (carbon monoxide, hydrocarbons and particulate material). The area of authorized burnings in the last harvest was less than 1% of the total area of sugarcane harvesting in the state (Figure 3.19).

In order to comply with the burning reduction target, sugarcane mills and suppliers have invested in the acquisition of fronts of sugarcane harvesting, systematization of sugarcane plantations for raw harvesting and labor force training.

Reduction in water consumption

The sugarcane mills of São Paulo have been reducing their water consumption by improving industrial processes and closing circuits with water reuse to meet the thresholds established by the agro-environmental zoning of the Sugarcane Sector, in the context of environmental licensing. Raw sugarcane (unlike burned sugarcane, which was washed with water) now goes through a dry cleaning process before proceeding to grinding, which also contributed to this reduction.

Between 2010 and 2017, there was a decrease of approximately 37% in the consumption of water for the industrial processing of sugar cane. In 1990, 5 m3 of water were used to process 1 ton of sugarcane in the mills; in the 2017/2018 season, this quantity decreased to 0.96 m3/t (Figure 3.20).

Protection of riparian areas

The sugarcane mills and suppliers, signatories to the Agro-Environmental Protocol, have committed to abandon the cultivation of sugarcane in riparian areas and to protect and restore these areas; the amount accompanies the dynamics of the agricultural areas of the sector. In the 2017/2018 season, approximately 210,720 ha of riparian areas and more than 6,850 headwaters with protection and restoration were accounted for, providing important environmental services for the state of São Paulo. Since the beginning of the Protocol, more than 38 million seedlings of native species has been produced and planted by the signatories to the Protocol (Figure 3.21).

Preventing and Fighting Forest Fires

The signatory sugarcane mills have a crucial role in preventing and combating forest fires in their areas of activity. Approximately 83% of the signatory sugarcane mills participate in the Mutual Aid Plan, Integrated Network for Emergencies (RINEM), or other regional agreement, to combat these fires, with a task force of approximately 1,350 trucks and 10,300 brigade members to act in these events.

It is important to emphasize that the Agro-Environmental Protocol for the Sugarcane Sector was a pioneering initiative in Brazil, and its area of coverage is restricted to the state of São Paulo.

The commitment brought about by the Protocol was reaffirmed in 2017 with the Greener Ethanol Agro-environmental Protocol, whose objectives were to target efforts at overcoming the challenges arising from the mechanization of sugarcane harvesting and the adoption of actions aimed at consolidating the sustainable development of the sugarcane sector in the state of São Paulo. The State Secretariats for the Environment and of Agriculture and Food Supply, Cetesb, the Brazilian Sugarcane Industry Association (UNICA) and the

Organization of Sugarcane Producers in the Middle-Southern Region of Brazil (Orplana) are members of this Protocol.

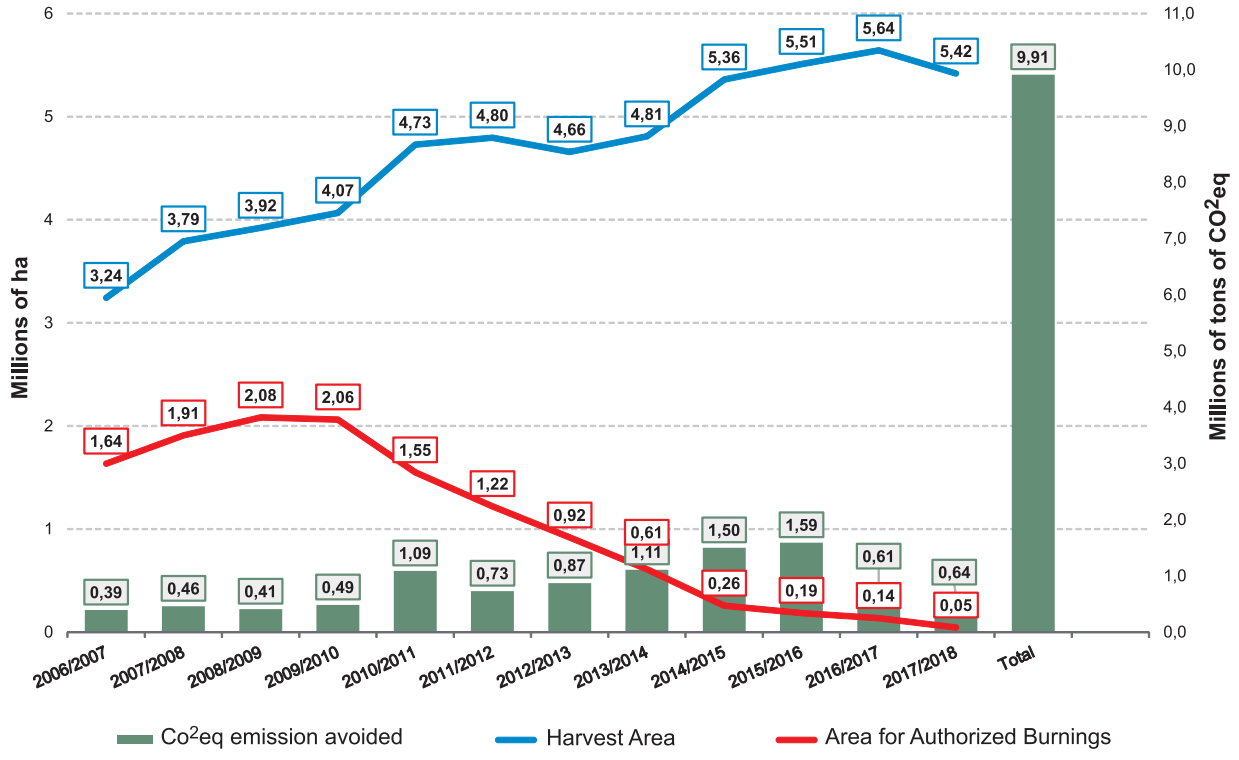
The main Technical Guideline of Greener Ethanol deals with the restoration of riparian areas in rural properties owned by sugarcane mills themselves and by suppliers signatories to the Headwaters Program, making the sugarcane sector an important contributor to the biggest project for the protection and restoration of riparian vegetation and headwaters in the state of São Paulo, thus contributing to the environmental preservation, to the biodiversity protection - including pollinators, and to the urban and rural supply of water. Until 2022, sugarcane mills should begin the restauration process of their riparian areas, while sugarcane suppliers should start this process until 2025.

The Greener Ethanol Protocol will begin to be implemented in the second half of 2018. Its first results will be available at the beginning of 2019.

The list of sugarcane mills and associations of sugarcane suppliers certified by the Agro-Environmental Protocol can be found at the Green Ethanol Portal, within the Environmental System of the state of São Paulo .

FIGURE 3.19

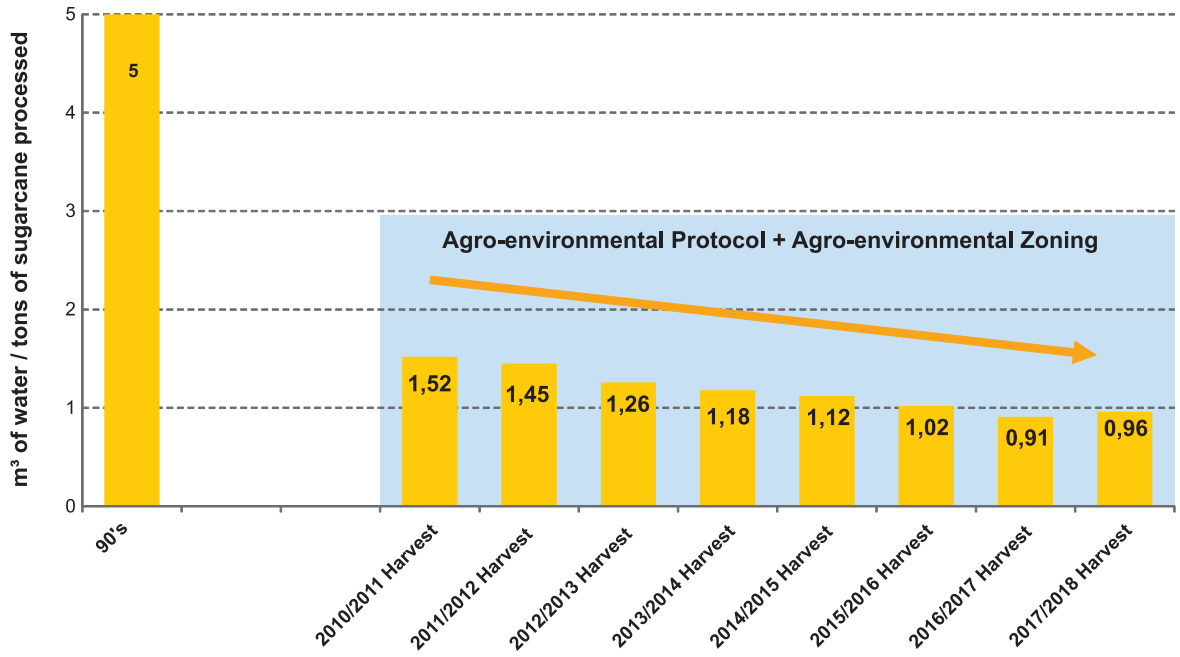
CO_2eq EMISSION REDUCTION AS A RESULT OF THE DECREASE IN LICENSES GRANTED FOR SUGARCANE BURNINGS



Source and preparation: SMA/CBRN (2018e).

FIGURE 3.20

REDUCTION IN WATER CONSUMPTION FOR SUGARCANE INDUSTRIAL PROCESSING AT SIGNATORY SUGARCANE MILLS

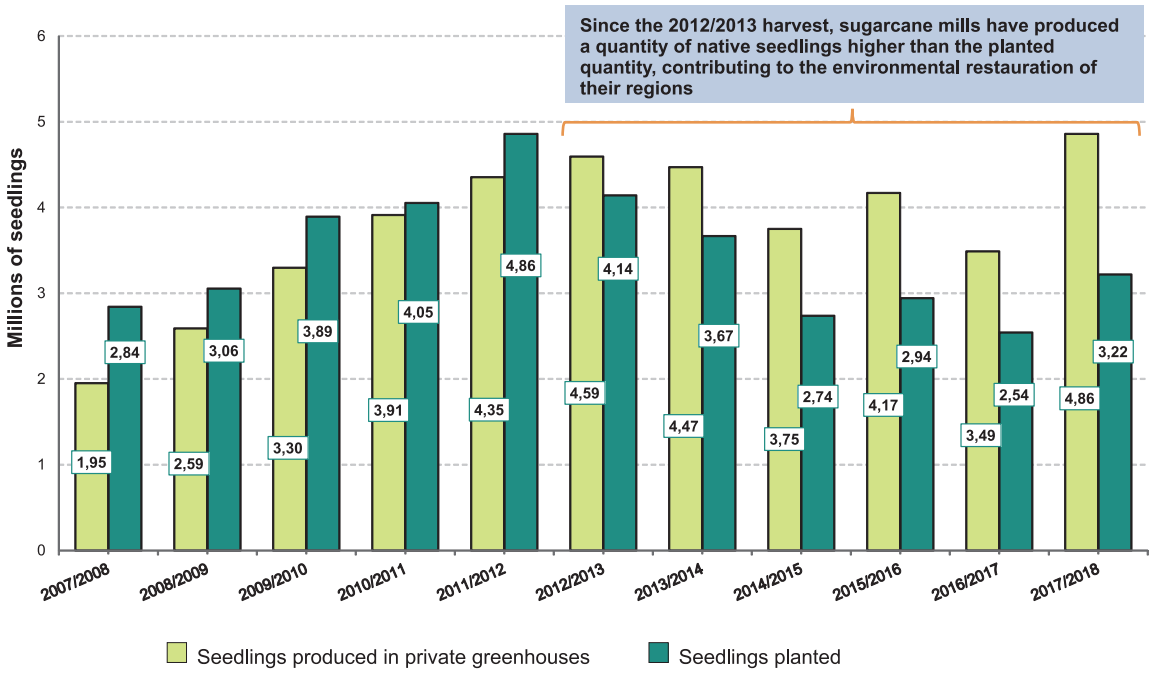


Source and preparation: SMA/CBRN (2018e).

In the graphic, read the comma as a dot.

FIGURE 3.21

PRODUCTION AND PLANTING OF NATIVE SPECIES SEEDLINGS BY SIGNATORY SUGARCANE MILLS



Source and preparation: SMA/CBRN (2018e).

In the graphic, read the comma as a dot.

Agro-Ecological Transition Protocol

The agro-ecological transition is a gradual process, with guidance and monitoring, for the transformation of productive and social bases in order to recover the fertility and the ecological balance of the agroecosystem in accordance with the principles of Agroecology, thus prioritizing the development of local and sustainable food systems, taking the social, cultural, political and economic aspects into consideration .

The Protocol

The State Secretariats for the Environment and of Agriculture (SMA/SAA), in conjunction with the Association of Organic Agriculture (AAO) and the Kairos Institute, signed the Agro-Ecological Transition and Stimulus to Organic Production Protocol on 22 May, 2016, in commemoration of the International Biodiversity Day The objective of the protocol is to support and facilitate the gradual process to change the conventional production system into an agroecosystem, in accordance with the principles of Agroecology in rural, urban and periurban areas in the state of São Paulo.

A checklist is applied at the production areas and it will integrate the Agroecological Transition Plan based on the protocol guidelines. Each group of farmers counts with technical monitoring to provide guidelines for improvement in their agro-environmental practices, as well as evaluation and follow-up to assess compliance with the Transition Plan.

Protocol Guidelines

I. Soil conservation and erosion control;

II. Increase in the proportion of organic matter in the soil;

III. Diversification of land use and increase in agrobiodiversity;

IV. Use of green manure and organic fertilizers;

V. Rational use and the reuse of water;

VI. Ecological management of pests and diseases;

VII. Environmental adequacy of the property;

VIII. Correct disposal of human waste and wastewater;

IX. Correct disposal of solid waste.

Until December 2017, 59 farmers voluntarily adhered to the Protocol, with technical assistance and rural extension offered by Kairos Institute, the Ecological Agriculture Center of the City of São Paulo, Administration of São Roque Tourist Resort, Work, Technical Assistance, Rural Extension and Environment Cooperative (AMATER) and Rural Development Offices of the Coordination of Technical Assistance and Rural Extension (CATI) from the cities of Piracicaba and São José do Rio Preto.

In order to prepare the various institutions involved with rural extension in the state to support the agro-ecological transition in different territories in São Paulo, four training sessions were conducted in 2017, totaling an audience of 140 technicians of the Rural Extension - SAA/CATI, in the cities of Bragança Paulista, Jales, Avare and Itápolis.

Other complementary actions were carried out in order to promote society's awareness and access to markets for producers in agro-ecological transition, such as the realization of Round Tables at events promoting the organic sector - such as the BioBrazil Fair and the Organic Cuisine Festival, and the support for producers to have access to local fairs and the institutional market.

Cadmadeira

Having the sustainable purchasing principle aligned with the objective of valuing companies that use sustainable wood from the Project São Paulo Amigo da Amazonia, the State Register of Legal Persons who sell, in the state of São Paulo, native forest products and by-products of the Brazilian flora (Cadmadeira) was created by State Decree nº 53.047/2008,

Cadmadeira is a voluntary register, managed by the Secretariat for the Environment, in which the legal person interested in commercializing, directly or indirectly, native products and by-products of the Brazilian flora must register. Only after the validation based on documentation analysis and the operation of the Forest Resources Utilization Module of the National System for Forest Product Origin Control (Sinaflor - DOF System), the company is apt to deliver native products and by-products of the Brazilian flora to the state of São Paulo.

As a complementary instrument, in order to foster legality and transparency in trading activities of native wood, companies receive the "Legal Wood Seal" when, in addition to their enrolment in Cadmadeira, they keep in their patios timber stocks organized by type, size and species, and submit the report on sales and stocks traded, for easy checking.

In this way, the Register allows for:

- Making the companies registered with Cadmadeira public, facilitating their identification by consumers;
- Guiding and encouraging businesses to comply with the law;
- Regulating the public procurement of native forest products from legal origin at the state level;
- Acting as an instrument of the state of São Paulo to control the origin of these products commercialized within the state's territory.

In December 2017, Cadmadeira counted with 194 companies apt to sell to public departments of the state of São Paulo, 26 of which received the Legal Wood Seal.

Payment for Environmental Services (PSA)

Payment for Environmental Services (PSA) is an economic instrument that allows for environmental service providers to receive payments made by the users of such service. This ensures the continuity of the environmental service supply, being beneficial for both the producers, most of whom are rural producers, and for society and the environment.

Rural landowners who keep an area in their property or recover a degraded area are collaborating to ensure that the ecosystem services are provided, and can be called environmental service providers. As the environmental services provided generate benefits that go beyond the limits of the property, contemplating society as a whole, a way to compenState the producers for their contribution must be sought.

In the state of São Paulo, the projects regarding Payment for Environmental Services, as provided for in State Law nº 13.798/2009 and regulated by State Decree nº 55.947/2010, are coordinated by the State Secretariat for the Environment, and aim at encouraging the preservation and conservation of native forests, which may include actions aimed at:

- Conserving forest remnants;
- Recovering riparian vegetation and the use of native vegetation for the protection of headwaters;
- Planting native species seedlings and/or carrying out practices that foster the natural regeneration to form biodiversity corridors;
- Reforesting areas with native species or with native species intercropped with exotic species for sustainable exploitation of timber and non-timber forest products;
- Implementing agroforest and silvipastoral systems which contemplate planting at least 50 samples of native tree species per hectare;
- Deploying commercial forests in areas adjacent to remnants of native vegetation to minimize edge effects;
- Managing forest remnants to control competing species, especially invasive alien species.

Currently, SMA coordinates five PSA projects, which are detailed below.

Mina D'água Project

Mina D'Água was the first PSA project implanted in the state of São Paulo, established by Resolution SMA nº 123/2010, in accordance with the State Policy on Climate Change. Its main objective is to establish methodologies and strategies for the implementation of PSA projects in the state. The project is carried out in a partnership with the municipalities and fosters the protection of headwaters in watershed areas used for public supply by means of economic incentives paid to rural landowners who voluntarily adopt policies to reduce deforestation and to protect the environment.

Environmental Credit of São Paulo - Project for Environmental Services Payment to Private Reservations of Natural Heritage (CAP/RPPN Project)

Environmental Credit of São Paulo - Project for Environmental Service Payment to Private Reservations of Natural Heritage (CAP/RPPN) is a pioneering public policy in the national scenario to foster environmental conservation on private land. The Project was established by SMA Resolution nº 89/2013, within the Forest Remnant Program. The project is run by the Forest Foundation (FF) in a partnership with the Coordination of Biodiversity and Natural Resources (CBRN) and Cetesb - technical agent of the State Fund for Pollution Prevention and Control (Fecop) - and aims at promoting the conservation and restoration of ecosystem processes in RPPNs and stimulating the creation of new private reservations in priority areas for the conservation of biodiversity in São Paulo, allowing owners to have financial return on environmental services provided.

Mata Atlântica Connection Project

The Project "Recovery of Climate Services and of Biodiversity in the Southeastern Corridor of the Brazilian Mata Atlântica" - Mata Atlântica Connection aims at increasing the protection of biodiversity and water and fight climate change. For this purpose, it promotes conservation activities for native vegetation, the adoption of more productive systems and the improvement of Conservation Units management.

Financed with resources from the *Global Environment Facility* (GEF), through the Inter-American Development Bank (IDB), the project has as its resource executive agency the Foundation for Scientific and Technological Enterprises (Finatec).

The departments responsible for the actions provided for are the Ministry of Science, Technology, Innovation and Communications (MCTIC) and environmental and research agencies from the states of São Paulo, Rio de Janeiro and Minas Gerais.

In the state of São Paulo, the Environmental System is responsible for the implementation of the project, by means of Forest Foundation and CBRN of the State Secretariat for the Environment. Their actions are guided by components in accordance with specific goals, and calls for the participation of society are made by means of public notices.

All payments activities regarding environmental services and certifications involved in the project strongly depend on the participation of local communities, whose needs and preferences guide the choice of services, methods of payment and certification systems.

In 2017, by means of SMA Resolution nº 86, SMA instituted the Project for the Payment of Environmental Services for the Protection of Native Vegetation (PSA PROTEÇÃO) to encourage the conservation of native vegetation and the ecological restoration in rural properties. The project innovates in the adoption of the methodology of reverse auction for the selection of areas in rural properties.

The Mata Altântica Connection Project, in 2018, anticipates the establishment of a new format for PSA to encourage the conservation of native vegetation, the ecological restoration and the adoption of sustainable production systems in rural properties in order to contribute to the reduction in emissions and/or the removal of greenhouse gases, and the conservation of biodiversity, soil and water resources.

Project for the Payment of Environmental Services (PSA Mata Ciliar)

The Project for the Payment of Environmental Services (PSA Mata Ciliar) was established within the Context of the Sustainable Rural Development Project (PDRS) by means of SMA Resolution nº 142/2017 and seeks synergy between SMA's initiatives with converging goals such as those of the Sustainable Rural Development Project, the Forest Remnants Program and the Headwaters Program.

PSA Mata Ciliar encourages the protection and restoration of native vegetation in rural properties up to four fiscal modules and which are exploited by small producers. Properties that possess riparian areas and/or fragments of natural successor vegetation with the potential for natural regeneration and which require protective actions to control degradation factors and threats, especially by the presence of animals for breeding and fire risk, can be contemplated.

The financial implementation of the PSA Mata Ciliar is carried out by the Local Management Unit of the Sustainable Rural Development Project (UGL - PDRS), which uses the Agrobusiness Expansion of São Paulo (FEAP) to carry out the payments.

Project for the Payment of Environmental Services in Areas for Wild Fauna Release and Monitoring (PSA ASMF)

The Project for the Payment of Environmental Services in Areas for Wild Fauna Release and Monitoring (PSA ASMF) was established by SMA Resolution nº 58/2016. The project considers that the reintroduction of wild fauna is a measure of management of forest remnants that aims for the conservation of biodiversity and the integrity of ecosystems and should be encouraged by the State Secretariat for the Environment, according to Article 57, Item V, of State Decree nº 55.947/2010.

Wild Fauna Management Actions

Since 2016, the Environmental System of the state of São Paulo has been dedicated to the construction of a normative instrument with a view to the institution of the State Policy on Wildlife. This work is being carried out by a Work Group (GT) established by Resolution SMA nº 26/2016, coordinated by SMA's Office and composed by the departments of the Environmental System which act directly on wildlife conservation, research, environmental education and management: CBRN, CFA, CEA, FF, IE, São Paulo Zoo Park Foundation of São Paulo (FPZSP), Cetesb and the Environmental Military Police.

The GT completed a first draft of the normative instrument in January 2018. This document was presented and discussed during the Workshop "State Policy on Wild Fauna: contributions and consensus", held in February 2018. The event counted with the participation of various actors involved in the implementation of the proposed policy or that have great technical and scientific knowledge on the theme, representing: the public authorities at the state, federal and municipal levels; the legislative power; the General Attorney's Office; the academic sector; commercial and non-commercial fauna joint ventures; environmental consulting companies; businesses; self-employed veterinarians; and non-governmental organizations.

Also, approximately 700 contributions to the proposal of the State Policy on Wildlife, developed during and after the workshop, have been received and evaluated by GT. The GT is finalizing a new version of the normative instrument draft.

State Program for the Identification and Control of the Population of Dogs and Cats (PEICPCG)

The coexistence of humans with dogs (*Canis familiaris*) goes back 10 thousand years and with cats (*Felis catus*), 4 thousand years. Data show that in the state of São Paulo, the dog/inhabitant ratio is approximately 1/4 and the cat/inhabitant ration is 1/1.611 and is influenced by the size of the municipality, the socioeconomic level of the population and the level of restriction imposed on the animals. The maintenance and breeding of these animals without control of their mobility and without supervision on the part of the owners provide the conditions for the growth of the population of community and feral animals, resulting from the abandonment. This can lead to disastrous consequences for the environment, with a growing number of abandoned dogs and cats who wander the streets, parks, and places in the municipalities of São Paulo.

The inappropriate breeding of dogs and cats leads to changes in the welfare standards for these animals, increasing the possibility of disease transmission. Likewise, the occurrences of accidents, such as aggression towards people and predation of native fauna increase, potentializing the risk of environmental contamination. Thus, the imbalance in the population of dogs and cats represents a significant threat to wild fauna present in native forest remnants, as well as to the populations of wild animals present in protected areas.

The number of reports and publications related to the impacts of the increase in the population density of domestic dogs and cats in the surroundings and in the interior of several natural areas has been growing (GOMPPER, 2014). Among the problems caused by the proximity of domestic dogs and cats to the native fauna, are the predation of wild animals, the territorial competition - the territory of the native animals decreases with the advancement of the domestic ones - and the mutual zoonoses transmission, which can affect the owners of the animals that enter the forest. Studies conducted in various regions of the world showed that domestic dogs act as reservoirs and carriers of virulent pathogens to wild animals (COURTENAY; QUINNELL; CHALMERS, 2001).

State Decree nº 55.373/2010 instituted the State Program for the Identification and Control of the Population of Dogs and Cats (PEICPCG) and authorized the State Secretariat for the Environment to conclude agreements with the municipalities of the state for its implementation.

Since its establishment, PEICPCG has received resources from parliament amendments intended to municipalities and non-profit entities. The transfer operations were conducted by means of agreements between SMA and the municipalities/NGOS, whose counterparts were items related to reproduction control and identification of dogs and cats, as well as logistical support during the implementation of registration and castration campaigns.

SMA Resolution Nº 03/2014 has established guidelines for the instruction of agreement processes with municipalities and entities of the civil society for the implementation of PEICPCG, in order to improve the implementation of the agreements and actions provided for in the program. Decree MS nº 1.138/2014 defines the actions and health services targeted at monitoring, preventing and controlling zoonoses and accidents caused by poisonous animals with relevance to public health. This guideline has restricted the use of resources targeted at actions in public health, thus limiting the implementation of castration campaigns for dogs and cats in municipalities, using resources from the Unified Health System (SUS), to exceptional cases. Thus, PEICPCG also assists municipalities in the search for alternative manners to obtain resources and means to identify and control the population of dogs and cats.

Until 2017, 38 agreements were signed. In the first stage of these agreements, the total number of animals - dogs and cats - castrated was 14,741; however, budgetary constraints prevented the transfer of the second installment planned for some of such agreements. Out of the total number of agreements signed, regarding those which received only the first installment and those which received the full amount of resources, 27 executed the first installment correctly, but nine did not, due to internal administrative and technical capacity deficiencies. Currently, there is one agreement in execution, with the Municipality of Joanópolis, which was signed in 2017.

It is noteworthy that for the implementation of measures regarding population control, zoonoses prevention and the implementation of efficient educational methods, it is necessary to know the social representations of the local population about these issues, taking into account the specific structural, socioeconomic and cultural conditions of the region (MACKENZIE, 1999).

In 2017, the theme “responsible care” was added to the list of actions of the biodiversity directive, within the GreenBlue City Program, which enabled the achievement of 10 regional trainings in the state of São Paulo, with representatives from 441 municipalities. Departing from this action, trainings in loco were carried out in 46 municipalities for teachers, with the collaboration of technicians of the NGO *World Animal Protection* (WAP), to reduce the number of bites and, consequently, the abandonment rate.

A public call to register educational institutions and NGOS who had an interest in working together with SMA in educational activities for responsible care in the municipalities of São Paulo, without transfer of resources, was carried out. The objectives of these activities are to share experiences, to facilitate the implementation of research on the theme in protected areas, and to provide educational materials, developed and tested by the partners, for the municipalities of São Paulo. Seven institutions of Higher Education, which offer the course in Veterinary Medicine, and two NGOS, were registered. In 2018, an intent protocol was signed by the Secretariat for the Environment and by legal representatives from the University of São Paulo - USP (representing the education institutions) and WAP (representing NGOS). The terms of agreement and/or technical cooperation are in the final phase of analysis for signature.

Scientific publications on the theme indicate that actions geared at educating the population and raising awareness about responsible care have positive results in the inhibition of abandonment and stimulate the insertion of the animal welfare principles as one of the ethical values directly related to citizenship.

Technical Guidelines to Monitor and Control the Brazilian Spotted Fever in the State of São Paulo

In part of the state of São Paulo, human cases of Brazilian Spotted Fever (FMB) are associated with the presence of capybaras (*Hydrochoerus hydrochaeris*), primary hosts of the ticks *Amblyomma sculptum* and amplifiers of the etiological agent *Rickettsia rickettsii*. Considering the interface between health and environment, the Agreement SMA/CBRN/DeFau Nº 2012/04 was signed between the State Secretariat for the Environment - responsible for authorizing wildlife management, and State Secretariat of Health, by means of the Superintendent for Endemic Control (Sucen) - whose responsibility is to characterize the risk to public health and make preventive recommendations about the disease.

In order to define guidelines to manage the capybaras population, aiming at minimizing the risks of disease transmission, 10 technical meetings were held to prepare the classification of areas in terms of FMB transmission risk, and measures to manage of the capybara populations. In this context, the Joint SMA/Sucen Resolution Nº 01/2016 was approved, and it contains the "Technical guidelines to monitor and control the Brazilian Spotted Fever in the State of São Paulo - area classification and prescribed measures", available at <www.ambiente.sp.gov.br> and <www.saude.sp.gov.br> (Tables 3.16 and 3.17).

TABLE 3.16

PROPOSAL FOR AREA CLASSIFICATION REGARDING THE BRAZILIAN SPOTTED FEVER TRANSMISSION RISK

Classification	Criteria	Validity
Quiet area	No notification/information about the vector *Amblyomma*.	Up to notification of human parasitism
Area without infestation	Two acarological studies negative for *Amblyomma* at a minimum interval of three and a maximum of six months.	Until further research
Infested area - Area under alert	- High frequency of human population; - Acarological study positive for *Amblyomma*; and - Significant absence of animals seroreactive to *Rickettsia* of the Brazilian Spotted Fever (FMB) group; Or - Areas with low human frequency; and - Low risk for tick infestation.	From 12 to 36 months, according to local characteristics
Infested area - Predisposed area	- Human population frequency - Acarological study positive for *Amblyomma*; and - Presence of vertebrate hosts amplifiers of *Rickettsia* of the Brazilian Spotted Fever (FMB) group;	Until the serological study is conducted
Infested area - Risk area	- Human population frequency - Acarological study positive for *Amblyomma*; - Significant presence seropositive sentinel animals of *Rickettsia* of the Group of FMB.	Five years, until new assessment
Infested area - Area of transmission	- Identification of Probable Location of Infection (LPI) of confirmed, or compatible cases of FMB.	Ten years, after which it returns to Risk Area

Source: SMA/CBRN (2018a), prepared by SMA/CPLA (2018).

TABLE 3.17

RECOMMENDED MEASURES FOR ENVIRONMENTAL MANAGEMENT AND POSSIBLE MANAGEMENT OF CAPYBARA POPULATIONS ACCORDING TO THE AREA CLASSIFICATION REGARDING THE RISK OF TRANSMISSION OF BRAZILIAN SPOTTED FEVER

Classification	Environmental and Capybara Management Measures
All infested areas	- Tick Control: Acarological Monitoring Manual from the Superintendent for Endemic Control (Sucen); - Prioritization of the use of physical mechanisms to the detriment of acaricides in the environment, due to the low efficacy of the latter, coupled with the potential risks of environmental contamination; - Wide dissemination of individual protection measures, information and indication of the possibility for the transmission of Brazilian Spotted Fever (FMB).
Under alert and predisposed areas	- Possibility of capybaras management only for the purposes of biological material collection for area reclassification.
Risk and Transmission Areas	- Proposition of area management necessary to reduce movement risks of the *R. rickettsii*; - Reproductive management to stabilize the population of capybaras, especially in locations without the possibility of a complete isolation of the area; - Management based on full removal of the population, in environments where physical isolation is possible; - Possibility of partial removals of seronegative individuals, provided that these are accompanied by the reproductive management of remaining seropositive individuals, with testing repeated annually; - Decision-making regarding the partial or total removal of the population of capybaras, taking into consideration the level of safety to public health for the area in question.

Source: SMA/CBRN (2018a), prepared by SMA/CPLA (2018).

The Agreement has proven to be an effective and pioneer instrument for the elaboration of public policies regarding the interfaces management of wildlife and risk to public health. In addition, it allowed for the establishment of management techniques for capybaras and generated technical-scientific subsidizes for the elaboration of territory occupation rules and environmental licensing of real estate enterprises, as well as plans for the prevention and control of other zoonoses.

It is noteworthy that within the context of environmental licensing of real estate enterprises, in a partnership with the licensing body Cetesb, a procedure was prepared to whose objective is to mitigate potential impacts to public health and wildlife, more specifically the prevention of transmission risks of FMB as a result of condominiums and enterprises involving land divisions (development or splitting).

In relation to the environmental licensing process conducted by C/Cetesb Board, the revision of the Guideline Manual for Housing Projects Approval (Graprohab Manual) contemplated the inclusion of a requirement to the entrepreneur to present the 'Technical Reports on the Vulnerability of the Area for FMB', to be prepared by Sucen for enterprises to be deployed in municipalities with confirmed human cases of FMB, as well as neighboring municipalities[26].

In relation to real estate enterprises licensing conducted at I/Cetesb Board, the procedure has already been incorporated into the group of technical requirements which are part of the environmental licensing rite. One of the main recommendations planned for inclusion in the above mentioned report consists in not allowing the creation of artificial lakes, because this is an environmental predisposing factor to the establishment and increase in the population of groups of capybaras already living in the area of influence of the enterprise.

26 The guidelines for real estate enterprises are available at Sucen's website: <http://www.saude.sp.gov.br/sucen-superintendencia-de-controle-de-endemias/homepage/destaques/vigilancia-acarologica-orientacoes-para-empreendimentos-imobiliarios>.

Actions upon the impact of yellow fever on the populations of Non-Human Primates (PNHs)

Yellow Fever is a viral disease transmitted by vector mosquitoes and introduced in Brazil from Africa hundreds of years ago. The virus can circulate in two basic cycles: the urban (which has not occurred in Brazil since 1942), in which the transmission occurs via the mosquito *Aedes aegypti*; and the sylvatic cycle, in which the disease circulates among monkeys (technically called 'Non-Human Primates' - PNHs) and other animals, primarily transmitted by the *Sabethes* and *Haemagogus* mosquitoes, which occur in forest areas. The yellow fever in Brazil presents an endemic occurrence, mainly in the Amazon region. Outside the Amazon region, outbreaks of the disease are recorded sporadically when the virus finds a population of susceptible individuals (people who have not been vaccinated). Primates are victims of the disease just as much as humans, and are considered sentinels of the yellow fever cycle because they get sick and/or die when infected by the virus, thus indicating that the disease is in the proximities. Therefore, health departments can take action immediately to prevent the transmission of the disease to humans.

Since 2016, the virus has been found in circulation again in some regions of the state of São Paulo, in its sylvatic cycle. From July 2016 to February 2018, health departments registered high mortality in PNH's: around 3,100 animals were found dead, 843 of which as a result of confirmed yellow fever[27]. Therefore, it is evident that, besides the risks to public health, the disease has a significative negative impact on the primate populations. The populational decline of primates in forest remnants is concerning, specially the bugio monkeys (*Alouatta clamitans* e *Alouatta caraya)*, since the majority of infected animals becomes sick and dies within just a few days. These animals represent a significative portion of the biomass in their ecosystems, in such a way that this type of disappearance may bring about changes in the food chain. Besides, bugio monkeys are important pollinizers, which helps keep the structure of the forest. The absence of these primates in the woods may also modify the structure of the vegetation in the long run.

Upon request from the Superintendent for Endemic Control, of the State Health Secretariat (Sucen/SES), between July and October 2017, technicians from CBRN, IF and FF were in the field to conduct a diagnosis of PNH occurrence in locations where a viral expansion was forecast, before the occurrence of notified epizooties, in the Northern Metropolitan Region of São Paulo (RMSP) Besides the contribution to epidemiological vigilance in the state, the information obtained in this project, which included participatory surveillance (information gathered with the population living in the area), will be used as subsidize for future conservation and biodiversity monitoring actions.

The team of the Environmental System of the state of São Paulo also participated intensively in the activities on epizooties vigilance in the State Park Alberto Löfgren (Native Forest Partk), including monitoring groups of bugio monkeys living in those areas and collecting samples for yellow fever diagnosis, between October 2017 and January 2018, since the first epizooty registered in the city of São Paulo.

At the level of the Work Group established to deal with the Silvatic Yellow Fever issue (Resolution SMA nº 158/2017), four technical encounters were conducted in February and March 2018, on the theme "Strategies for Epizooties Vigilance in Non-Human Primates (PNHs) in protected areas within the yellow fever context" The objective of the event was to empower employees of the Forest Foundation Conservation Units to meet the demands arising from the expansion of virus circulation towards the Northern Coast, Ribeira Valley/Southern Coast, Baixada Santista and Paraíba Valley/Serra da Mantiqueira, in addition to integrating actions and contacts of the departments of the Environmental System of the state of São Paulo with health departments, totaling 150 trained people. The events promoted an approximation between the Environmental and Health sectors at the regional level, highlighting the inseparable association between animal health, environmental health and human health and the need to integrate teams to optimize the implementation of preventive and monitoring actions against the yellow fever, incorporating the assessment of the impacts of the disease on biodiversity conservation.

27 Source: Boletins Epidemiológicos do Centro de Vigilância Epidemiológica "Prof. Alexandre Vranjac" (CVE/SES), available at: <http://www.saude.sp.gov.br/cve-centro-de-vigilancia-epidemiologica-prof.-alexandre-vranjac/areas-de-vigilancia/doencas-de-transmissao-por-vetores-e-zoonoses/agravos/febre-amarela/boletim-epidemiologico>.

In relation to PNHs kept in captivity sites, such as zoos and breeding areas, all the actions involving wild fauna recorded in the Integrated System for Wildlife Management (GEFAU) were instructed to protect the areas that house those primates with mosquito nets. Decrees which restricted the transportation of PNHs within the state were also published, to prevent the possibility of virus dispersion to areas with no record of viral circulation. Primates kept in flocks at institutions such as zoos, maintenance sites and sorting centers, may become part of reintroduction and population strengthening programs in areas impacted by the yellow fever.

To prevent aggression against primates by people who associate the transmission of the disease with the animals, the Environmental System of the state of São Paulo launched the campaign 'The Monkey is not the Villain', with information made available at SMA's website, social media and in the press.

It is worth mentioning that the state of São Paulo has a Permanent Committee on the Protection of Primates Native to the State of São Paulo, established in 2014, which constitutes a forum formed by the civil society, the government and the academic area, which is important for the discussion of future actions toward the conservation of monkeys. Considering the current scenario of threats to primate conservation, the Environmental System envisions, with the support of the Commission, the intensification of actions directed at the conservation of species of primates in the territory of São Paulo, especially those that at some degree are under threat of extinction.

Environmental Education Actions

Environmental Education (EA) is an ongoing process of learning and training for individual and collective reflection and for the construction of values, knowledge, skills, attitudes and competencies, aiming at the improvement of quality of life and a sustainable relationship between human society and the environment that integrates it. EA is understand as the processes by which conditions are created for individuals and social groups to understand issues regarding environmental problems, to build collective understandings about them and to develop organizational capacities and policies to face them at their root. Therefore, EA should contribute to raise awareness about the relationships between individuals and groups in society which affect the ways by means of which the relationships between society and the environment are expressed.

Having this design and considering the context of public environmental management that characterizes the actions of the different departments of the Environmental System of the state of São Paulo, the Environmental Education Coordination (CEA) developed in 2017 what became an agenda for Environmental Education policies structured around two axes that strengthen the sense of EA as the space of citizenship in the development of public policies related to socio-environmental issues (Table 3.18).

TABLE 3.18

AXES THAT STRUCTURE THE ENVIRONMENTAL EDUCATION AGENDA STARTED IN 2017

Axis 1	Axis 2
Strengthening Environmental Education in the State of São Paulo Departing from such strengthening, CEA dialogs with different segments, such as the civil society, the municipalities and other areas of the State Government responsible for different sectoral policies that should have their educational dimension recognized and developed by Environmental Education	**Strengthening Environmental Education in State Environmental Management** Within this axis, the interlocution is made with the different departments of the Environmental System of the state of São Paulo responsible for the operation of the environmental policy instruments in the state. The intention in this axis is to foster Environmental Education

Source and preparation: SMA/CEA (2018).

Both axes shelter programs whose objective is to give an institutional character to projects and actions arising thereof, and which are organized as shown in Table 3.19.

TABLE 3.19

ENVIRONMENTAL EDUCATION PROGRAMS PER AXIS

Axis 1 – Strengthening Environmental Education in the state of São Paulo	Axis 2 – Strengthening Environmental Education in State Environmental Management
• Expansion Program for social participation in EA • EA Program in sectoral policies • Training and Capacitation Program for municipalities	• EA Identity Consolidation and Alignment Program within the Environmental System of the state of São Paulo • EA Program within environmental policy instruments

Source and preparation: SMA/CEA (2018).

Table 3.20 summarizes what has been achieved with the programs developed.

TABLE 3.20

ACTIONS DEVELOPED WITHIN THE ENVIRONMENTAL EDUCATION COORDINATION PROGRAMS

Programs	Developed Actions	Results
Axis 1 Strengthening EA in the state		
Expansion of social participation in EA	Meetings with the State Secretariat of Education, municipalities, universities and the civil society to improve and finalize the draft decree regulating the State Law Nº 12.780/2007.	Conclusion of the draft for the regulation of the State Policy for Environmental Education - Law Nº 12.780/2007.
	Development and distribution of publications.	Availability of publications for libraries and Municipal Environmental Education Centers and civil society institutions by means of a download at SMA's website, and in print, with approximately 50,000 copies distributed in 2017.
		Technical coordination and preparation of content for the document "Instruments for Environmental Planning, Licensing and Management in the state of São Paulo - Support Brochure for Professionals".
EA in sector policies	**Policies for Water Resources Management**	
	Acting as a Fehidro technical agent , conducting the technical feasibility and project cost analyses for projects indicated by associations.	100 technical opinions and 40 technical information documents issued regarding projects submitted in 2017 and in progress.
		Considering the 20 new projects submitted in 2017, 10 were approved.
	Coordination of the Technical Chamber for Environmental Education, Training, Social Mobilization and Information about Water Resources (CTEA) of the State Water Resources Council (CRH).	Preparation of the draft on the Permanent Training Program in Water Resources Management.
		Preparation of the draft which lays down the principles and guidelines for EA Regional Programs at the CBHS.
	Educational Policies (elementary school)	
	Preparatory meetings for youth conferences on the environment at the local (schools), state and national levels.	Preparation of the V Youth Conference on the Environment.
Training and capacitation for municipalities	Capacitation within the context of the GreenBlue City Program (PMVA).	Realization of five Environmental Education Workshops in Capacitation of PMVA.
	Lectures for the preparation of Fehidro Projects.	Realization of five orientation lectures.

Axis 2 Strengthening EA in Environmental Management		
EA Identity Consolidation and Alignment in the Environmental System of the state of São Paulo	Meetings of the Committee on Environmental Education Integration.	Survey on the actions of environmental education of the Environmental System of the State of São Paulo.
EA on the instruments of the Environmental Policy	**Establishment and Management of Protected Areas**	
	Coordination of the Social Participation Work Group for each stage of public consultations before the management councils of Conservation Units (UCs).	Methodological conception of social participation in the elaboration of management plans, implementation in five UCs (20 meetings with about 500 participations conducted), evaluation, methodology consolidation and methodological contributions to the new roadmap for the Management Plans of the state of São Paulo.
	Environmental Inspection	
	Participation in the workshops of the Socio-Environmental Training Program of the Managing Councils of Conservation Units, together with the Coordination of Environmental Inspection (CFA).	Printing the Environmental Training Guide Publication, with CEA's participation in the content preparation. Participation in seven workshops to develop the Socio-Environmental Training at the Regional Council of the Environment, Sustainable Development and Culture of Peace (CADES) in Casa Verde, Cachoeirinha and Limão Neighborhood (overlapping Cantareira State Park Buffering Zone).
	Participation in the Rehabilitation of Offenders Work Group within the Environmental Conciliation Program, in conjunction with CFA.	Printing the Legal Environmental Conduct Publication, with CEA's participation in the coordination.
	EA Spaces in the Environmental System of the state of São Paulo	
	Partnership with the Geological Institute to improve public services by means of the analysis of documents to be included in the historical archives of the Geological Museum (MuGeo).	Document Analysis Support for the development of the Terms of Reference for MuGeo procurements
	Partnership with the Botanical Garden for the APP development.	Content development for the public visitation APP.

Source and preparation: SMA/CEA (2018).

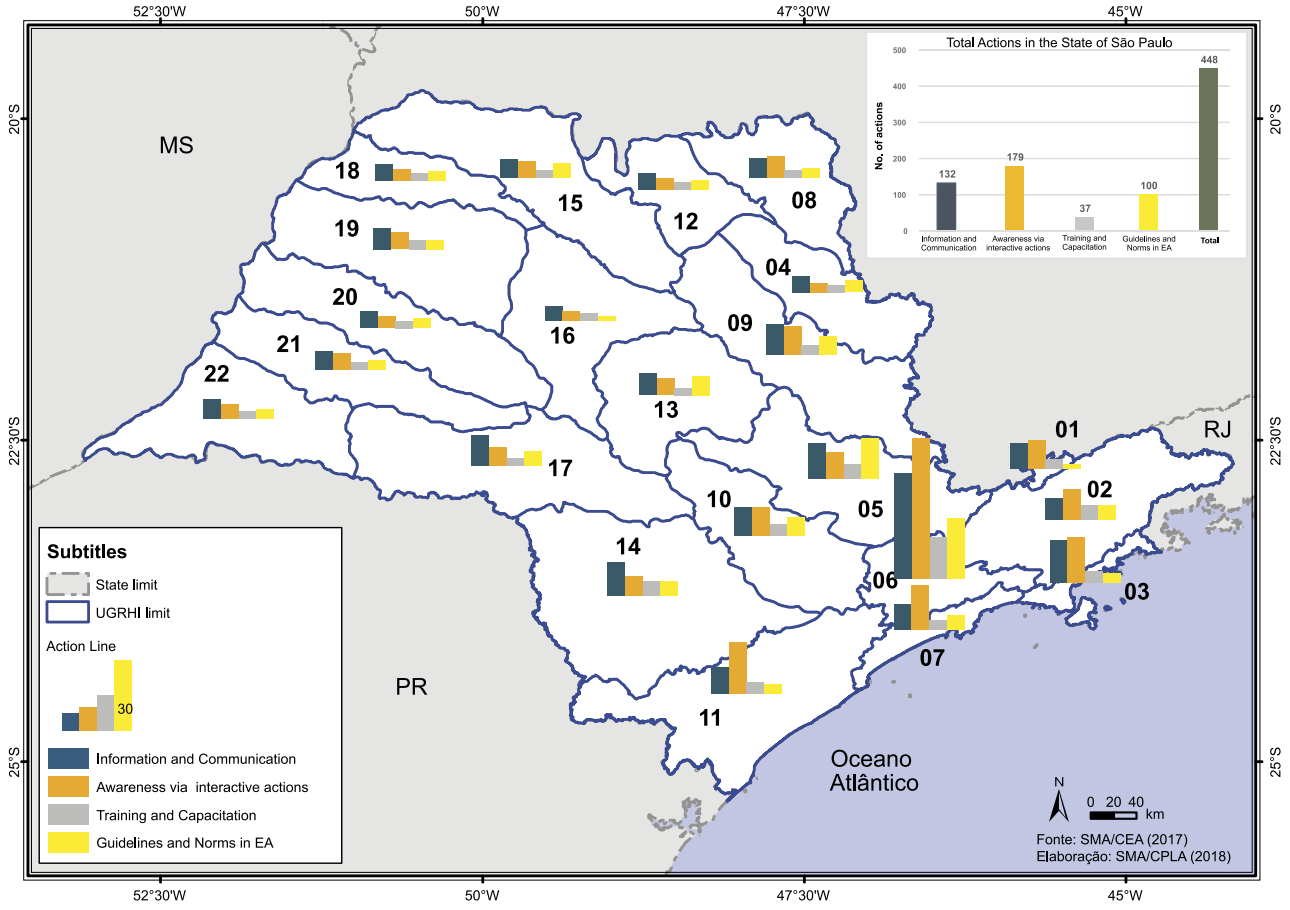
The Committee on Environmental Education Integration, coordinated by CEA, was established in 2017 by means of Resolution SMA Nº 33 and aims at coordinating and monitoring EA actions developed within the Environmental System of the state of São Paulo.

In 2017, by means of the Committee, a survey on the continuous EA actions developed by the institutions of the System throughout the state of São Paulo, all related to and integrated with other public policies, such as protected areas, wildlife, water resources, inspection and licensing, was conducted.

These actions were mapped and divided among the 22 Hydrographic Unit for Water Resources Management) (UGRHI), as shown in Figure 3.22. CBRN, CEA, Cetesb and 42 regional agencies, CFA and 7 Regional Technical Inspection Centers, CPLA, CPU, Forest Foundation (Ecological Stations, State parks, Sustainable Development Reservations, State Forest, APAs and Marine APAs - totaling 43 Marine Conservation Units), São Paulo Zoo Park Foundation, the Forest Institute (with the participation of one Ecological Station and 2 State Forests), PAmb and PMVA anticipated in the survey.

FIGURE 3.22

ENVIRONMENTAL EDUCATION ACTIONS IN THE STATE OF SÃO PAULO IMPLEMENTED BY THE ENVIRONMENTAL SYSTEM OF THE STATE



Source: SMA/CEA (2018), prepared by SMA/CPLA (2018).

The EA actions were divided into four lines: Information and Communication; Awareness via Interactive Actions; Training and Capacitation; and Guidelines and Norms in EA.

As shown in Figure 3.22, the greater part of the actions targeted public Awareness by means of interactive actions (activities). Therein are included the monitored visits, playful activities, commemorative events and programs that have as their goal to carry out actions that seek to articulate and integrate specific target audiences for the institution or themes related to the environment. Actions aimed at Environmental Education for people who have been fined during environmental inspections or audits were also conducted.

The second type of EA action more frequent in the state is targeted at Information and Communication activities to inform and/or communicate with the public in a passive or low-interaction manner (i.e., based on the public's demand). Passive interactions with formative focus (and not only informative) in relation to environmental issues; production of educational and/or informative materials (printed, or not); curatorial exhibits (whether of long duration, temporary or itinerant) or informative panels about environmental issues; events organized or supported by the institution of the Environmental System; collections made available for consultation of external audiences; and visitor centers at parks that have staff and/or physical infrastructure to clarify questions or give instructions about the environmental characteristics of the place to be visited integrate this line.

The third line includes the actions for Training and Capacitation, which involve activities whose focus is the professional formation or training about issues related to the environment. This line covers technical training activities of the institutions via streamlining courses, study and research groups and training courses for external agents, specially teachers or other specific audiences.

Finally, the lower incidence of EA actions occurred in the Guidelines and Norms in EA, related to the guidelines for the preparation and analysis of EA programs and projects for activities that constitute an action plan (and not only routine activities), as well as to the development of EA guidelines.

State Program for Sustainable Public Procurement (PECPS)

The State Program for Sustainable Public Procurement (PECPS), established by means of State Decree nº 53.336/2008, has as its purpose to implement, promote and articulate actions aimed at inserting socio-environmental criteria in public procurement in the state.

Based on the adherence of the state of São Paulo to the Marrakesh Process (2003), which resulted from the World Summit on Sustainable Development (Rio + 10), the Program encourages new markets and the emergence of alternative products and services, thus promoting actions that improve the efficiency in the use of resources and the impact on the environment, and that foster social equality.

The main instrument of the program is the Environmental Seal, created by means of Decree nº 50.170/2005 (Figure 3.23) and it guides public managers responsible for purchasing and procurement to identify materials and services that adopt at least one of the socio-environmental criteria below:

- Fostering social policies;
- Valuing transparency in management;
- Savings energy and water consumption;
- Minimizing waste generation;
- Rationalization in the use of raw materials;
- Reduction in pollutant emissions;
- Adoption of less aggressive technologies to the environment;
- Using low toxicity products.

FIGURE 3.23
SOCIO-ENVIRONMENTAL RESPONSIBILITY SEAL

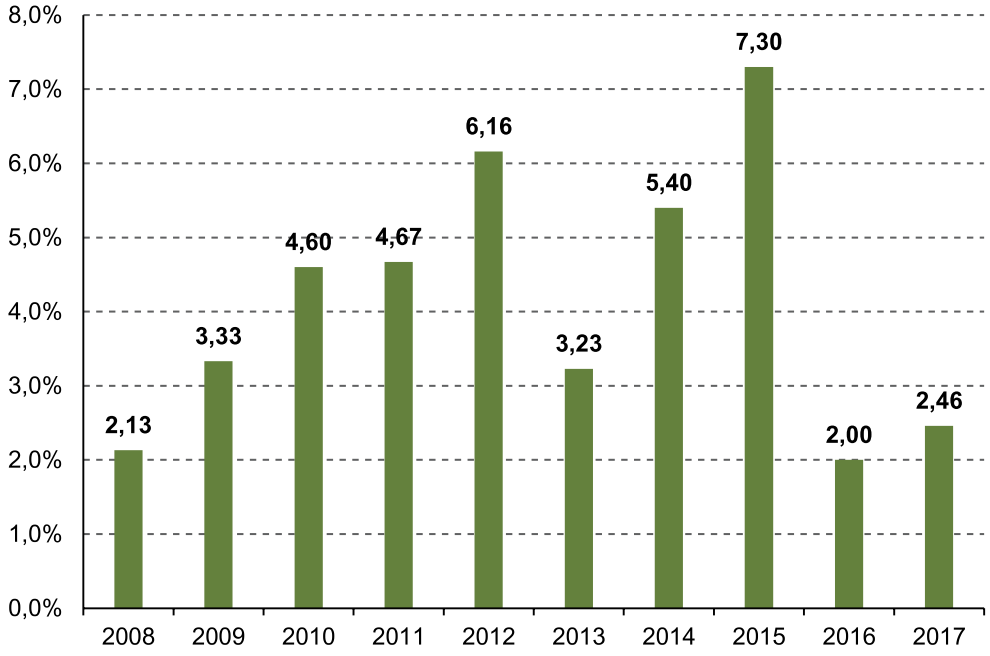
Source and preparation: SMA/PECPS (2018).

In 2017, the percentage of purchases made by state organs and entities with the Environmental Seal was 2.46%, equivalent to approximately R$133 million.

The variations in the percentages since the Program's inception in 2008 until 2017 can be seen in Figure 3.24.

FIGURE 3.24

PERCENTAGE OF PURCHASES MADE WITH THE ENVIRONMENTAL SEAL FROM 2008 TO 2017



Source and preparation: SMA/PECPS (2018).

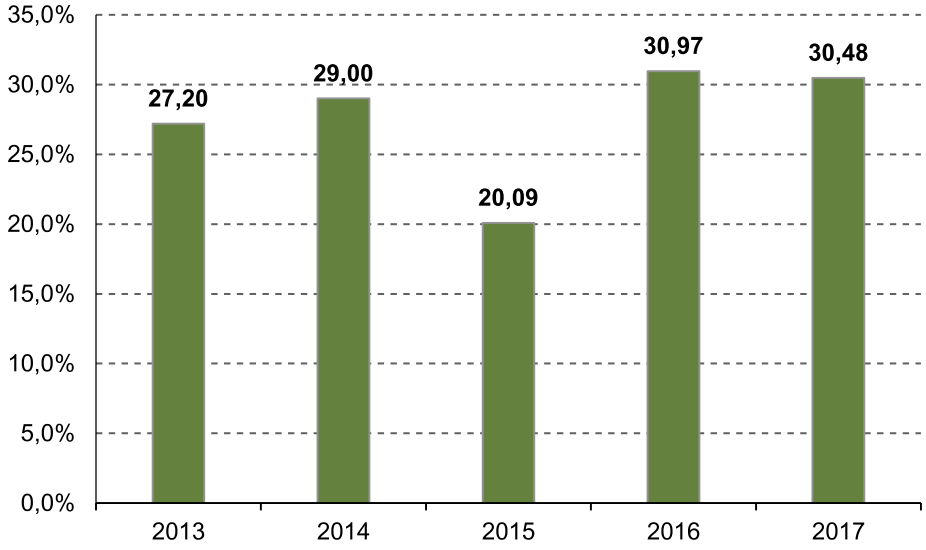
[[Translator's Note: in the graphic, read the comma as a dot]

The Secretariat for the Environment also acknowledges with the Socio-environmental Seal the Technical Books of Outsourced Services (CADTERC), whose objective is to disseminate the guidelines to hire outsourced service suppliers by the organs of the State Public Administration.

Its monitoring began in 2013 and in 2017, 30.48% (approximately R$2.5 billions) in common services (such as security, cleaning, catering, corporate printing, among others) followed the environmental guidelines present in CADTERC. Figure 3.25 illustrates the percentage of services hired under the seal between 2013 and 2017.

FIGURE 3.25

PERCENTAGE OF SERVICES HIRED UNDER THE SOCIO-ENVIRONMENTAL SEAL BETWEEN 2013 AND 2017



Source and preparation: SMA/PECPS (2018).

[Translator's Note: in the graphic, read the comma as a dot]

GreenBlue City Program

The GreenBlue City Program (PMVA) was launched in 2007 by the Government of the state of São Paulo, through the State Secretariat for the Environment, with the innovative purpose of encouraging and empowering municipalities in São Paulo to formulate and implement public policies for environmental management.

PMVA believes in knowledge as an instrument of environmental management which, when incorporated by the local public power, allows for the planning and execution of actions that promote the continual improvement of environmental quality in each cycle. The program's expectation is that the inclusion of the environmental variable in the local agenda can also promote advances in the economic and social aspects. The program is based on the proposition of "tasks" common to all 645 municipalities in the state which are distributed in 10 Directives: Sustainable Municipality, Structure and Environmental Education, Environmental Council, Biodiversity, Water Management, Air Quality, Land Use, Urban Arborization, Treated Sewage and Solid Waste.

The procedures for a Municipality's participation in PMVA are:

- Signature of the Adhesion Term by the mayor;
- Nomination of an Interlocutor and Deputy by the mayor; they will receive the Program's training and will be responsible to articulate with the municipal administration and the civil society to develop the directives;
- Submission of documentation proving the development of proposed actions.

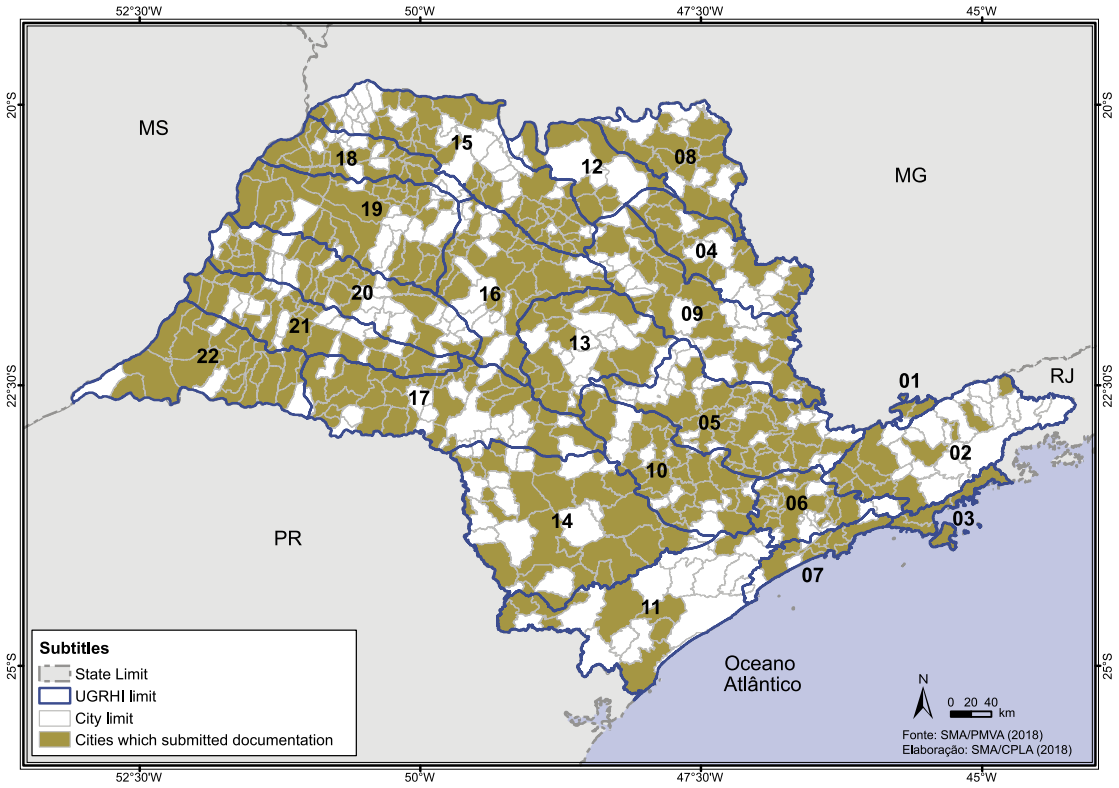
PMVA certifies those municipalities that reach an evaluation equals to or higher than 80 points. Evaluations refer to the analysis of the documentation forwarded by municipalities to PMVA's technical team, thus proving the actions proposed in the Resolution SMA nº 33/2018. In addition, the participation of the municipalities of the state of São Paulo in PMVA is one of the analysis criteria for the distribution of public resources from the State Fund for the Prevention and Control of Pollution (Fecop).

In general, PMVA advocates the development of projects and programs justifying the maximum "Local Action for a Global Cause".

2017'S environmental cycle counted with the nomination of 604 interlocutors throughout the state of São Paulo.

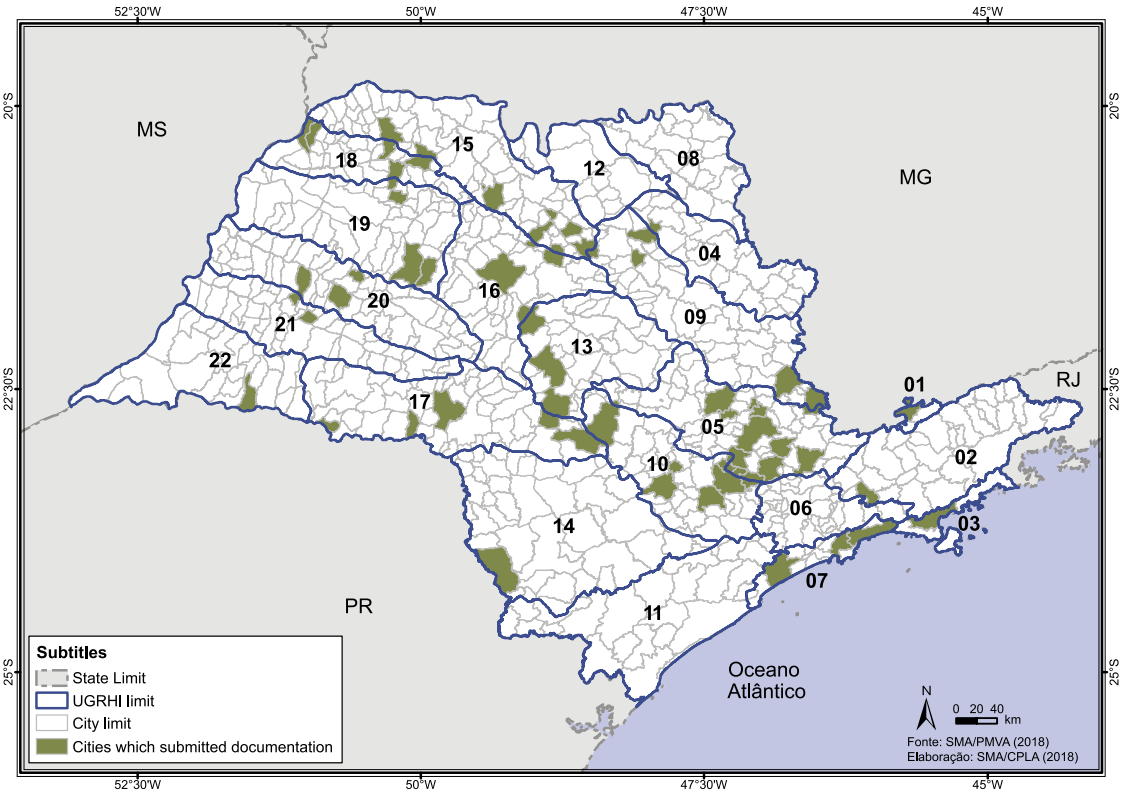
- 381 municipalities presented documentation evidencing the "tasks" proposed (Figure 3.26);
- 347 municipalities presented an increase in their evaluation compared to 2016;
- In 2017, 53 municipalities received the GreenBlue Municipality certification, with a score higher than, or equals to 80 points (Figure 3.27).

FIGURE 3.26
SPATIAL DISTRIBUTION OF MUNICIPALITIES THAT SUBMITTED DOCUMENTATION IN 2017



Source: SMA/PMVA (2018), prepared by SMA/CPLA (2018).

FIGURE 3.27
SPATIAL DISTRIBUTION OF MUNICIPALITIES CERTIFIED IN 2017



Source: SMA/PMVA (2018), prepared by SMA/CPLA (2018).

In 2017, PMVA proposed the implementation of 85 "tasks" within the 10 directives listed above to municipalities. Examples of such "tasks" are shown in Table 3.21, as well as the number of municipalities that submitted documentation evidencing such actions in the 2016 and 2017 cycles.

TABLE 3.21
NUMBER OF MUNICIPALITIES THAT COMLETED "TASKS" IN 2016 AND 2017

Tasks completed by municipalities	2016	2017
Monitoring water quality for public supply	112	281
Municipal Plan for Solid Waste Integrated Management	205	319
Permanent structure for selective waste collection and reusable/recyclable/compostable waste	121	222
Legislation conditioning civil construction permits to the use of legal origin wood with the presentation of DOF (Forest Origin Document)	130	189
Urban Arborization Plan	114	211
Evaluation of Black Smoke for diesel vehicles used by the city's fleet	165	256

Source and preparation: SMA/PMVA (2018).

In addition to the examples in Table 3.21, new "tasks" were included in PMVA's policies in 2017. Table 3.22 shows the number of municipalities which presented documentation regarding the new tasks proposed by the program.

TABLE 3.22
NUMBER OF MUNICIPALITIES THAT SUBMITTED SUPPLEMENTARY DOCUMENTATION REGARDING PMVA'S NEW "TASKS"

New "tasks"	Number of municipalities
Using Other alternative renewable sources of energy	87
Substituting fossil fuels by renewable ones, or incentivizing the use of public transportation and/or non-mWotorized transportation means	180
Mapping urban burnings	236
Mapping hazardous geodynamic processes	243
Urban Forest Pilot	90
Tree Space	43
Mata Atlântica Forest and/or Savannah Plan	80
Environmental Structure	316

Source and preparation: SMA/PMVA (2018).

For more information on PMVA, access the electronic address <http://verdeazuldigital.sp.gov.br/site/o-projeto/>.

DataGEO

DataGEO is the Environmental Spatial Data Infrastructure[28] of the state of São Paulo, which offers a wide variety of cartographic bases and geospatial data for society as a whole, in a simple and unbureaucratic manner, providing inputs and raw materials for the generation of new information and territorial analyses correlated with environmental issues.

The Environmental Territorial Information Basis provided by DataGEO comprises, among others, the following sets of information: Satellite images, cartographic bases, political-administrative units, biotic data, physical data, anthropic data, socioeconomic data, environmental legislation, quality data and environmental monitoring.

Access is via the internet[29], with no need for registration, so that the information can be accessed by the citizen using the browser of his preference, via a Geoportal, or accessed directly via information systems or Geoprocessing software.

DataGEO's main objectives are:

- To share information, facilitating the access to, and exchange of geographic data between producers and users;
- To make official and qualified information available;
- To integrate, and make spatial information and databases available among institutions.

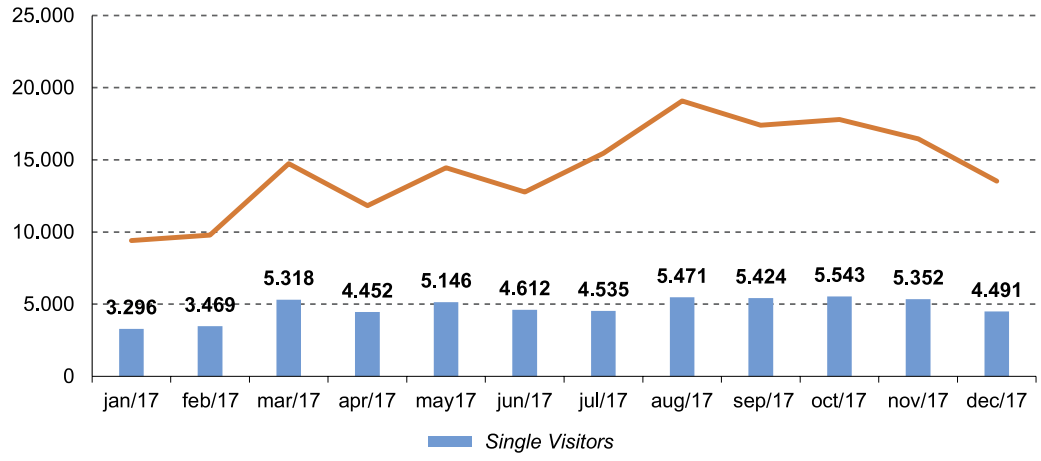
In 2017, 105 new layers were incorporated into DataGEO. Among these, the layers regarding water bodies Classification - Hydrography 1:50,000, the Pedological Map of the State of São Paulo and the Ecological-Economic Zoning of the North Coast are worth mentioning.

In the second half of 2017, DataGEO Capacitation trainings were carried out throughout the state of São Paulo, which meant an increase in the number of hits per month, as seen in Figure 3.28.

Figure 3.28 also illustrates the quantity of unique hits and the number of visits in 2017. The number of unique hits takes into consideration how many IPs accessed DataGEO on the day. The number of visits indicates how many times the site was visited in the period.

FIGURE 3.28

NUMBER OF ACCESSES TO DATAGEO IN 2017



Source and preparation: SMA/CPLA (2018).

[Translator's Note: (i) Single Visitors; (ii In the graphic, read the dot as a comma]

28 Spatial Data Infrastructure (IDE) is the term used to describe a set of technologies, policies and institutional arrangements that promote the supply of, and access to spatial data. It is based on a dynamic, hierarchical and multidisciplinary concept including people, data, access networks, institutional policies, technical standards and human resources in order to facilitate and coordinate the exchange and sharing of geographic data among all interested parties (RAJABIFARD et al., 2006).

29 Available at the electronic address <http://datageo.ambiente.sp.gov.br/>.

Cetesb's Programs in the International Environmental Agenda

Cetesb has dedicated a significant part of its efforts to establish exchanges with similar institutions in other countries and with various international bodies, in order to enable the exchange of scientific and technological knowledge, the acquisition of resources for environmental projects and the integration with partners, who work for life quality on our planet, with the common goal of sustainable development.

Following this strategy, Cetesb has advanced in various activities, such as acting as a Regional Center for the Stockholm Convention on Persistent Organic Pollutants (POPs) of the United Nations Environment Program (UNEP) for the Latin America and the Caribbean regions. As a Regional Center, it has endeavored to develop projects for technical training and skill building for Latin America and the Caribbean countries, as well as for environmental departments of other Brazilian states.

In 2017, Cetesb acting in the capacity of a Regional Center for the Stockholm Convention on Persistent Organic Pollutants (POPs) for Latin America and the Caribbean carried out the following activities: (i) training, technical assistance and technology transfer, by means of short-term and/or long term courses, in addition to courses in virtual environment via long distance learning; (ii) national and international workshops in conjunction with the Secretariat for the Stockholm, Basel, an Rotterdam Conventions, the Minamata Convention on Mercury and Strategic Approach for Chemical Substances Integrated Management (SAICM); (iii) strengthening institutional capacity for chemical substance management by establishing the necessary structure for the implementation of national legislation on industrial chemicals; iv) implementation of pilot projects for the environmental management of chemical substances as per the Stockholm, Basel, and Rotterdam and Minamata Conventions: diagnosis of environmental contamination by sulfonic perfluoroctano acid (PFOS) and by sulfluramide use, by means of an agreement signed in 2007 between the Brazilian Company for Agro Research (Embrapa) and the Ministry of Environment (MMA); (v) support to the MMA for the development of priority actions of the National Plan for the Implementation of the Stockholm Convention on POPs; (vi) support to Latin America and the Caribbean countries, and to African Portuguese-speaking countries in the implementation of the Stockholm Convention on POPs; (vii) implementation of the Regional Center page on Cetesb's website: to promote the exchange, in an agile manner, of relevant information for the implementation of the Basel, Rotterdam and Stockholm Conventions.

In compliance with the State Policy on Climate Change (PEMC), in 2017, Cetesb gave continuity to the coordination and implementation of several projects: i) approval by the Technical Chamber of the Committee on the Basins of Baixada Santista to obtain Fehidro's resources for the Technical Capacitation Project for Municipalities, to identify vulnerabilities and suggest measures for the adaptation to, and prevention of climate change effects on water resources; (ii) review and availability for public consultation of the Inventory on Emissions of the Land Use, Change in Land Use and Forest Sectors (2011-2015), prepared by the Foundation for the Support to Research Projects on Science and Space Technology (Funcate); (iii) reception and analysis of the inventories on greenhouse gases (GHG) of industries of the state, regarding the decision by Cetesb's Board nº 254/2012; iv) availability for public consultation and presentation, at an open event, of the results of the Cooperation Project developed with the Inter-American Development Bank (IDB) "Support for the Development of Mitigation Studies for the State of São Paulo".

The Aichi Targets

In 2010, the 10th Conference of Parties (COP) to the Convention on Biological Diversity (CBD) took place in Nagoia, capital of the Province of Aichi, Japan. One of the themes discussed was the definition of a Strategic Plan for Biodiversity in the period 2011-2020, also called the Aichi Targets. During the conference, the Parties agreed to work together to implement 20 targets, divided into five goals, until 2020. This plan is considered the basis for current planning regarding the implementation of the CBD.

In 2011, the state of São Paulo formalized the CBD Strategic Plan 2011-2020, reaffirming the commitments for strategic planning for Biodiversity, made by the Government of São Paulo.

These targets are presented in the following way:

- ✓ Strategic Objective A (Targets 1 to 4): To treat the real causes of biodiversity loss, internalizing the theme "biodiversity" within the entirety of the government and society as a whole.
- ✓ Strategic Objective B (Targets 5 to 10): To reduce direct pressures on biodiversity and promote sustainable use.
- ✓ Strategic Objective C (Targets 11 to 13): To improve biodiversity situation (status), protecting ecosystems, species and genetic diversity.
- ✓ Strategic Objective D (Targets 14 to 16): To emphasize the benefits of biodiversity and ecosystem services to everyone.
- ✓ Strategic Objective E (Targets 17 to 20): To enhance and extend the implementation by means of participatory planning, of knowledge management and training.

The implementation of the Aichi Targets in Brazil follows a National Action Plan being developed by means of a process coordinated by the Ministry of the Environment (MMA). This plan is the result of the "Dialogs on Biodiversity: Building the Brazilian strategy for 2020", a process driven by a series of partners and that counted with the presence of the Secretariat for the Environmental of the State of São Paulo, among other important institutions for the Brazilian and global scenario of biodiversity conservation .

The State of São Paulo was present in Aichi, in 2010. In October 2011, by means of State Decree Nº 57402, the São Paulo Commission on Biodiversity (CPB) was created to implement the targets on the territory and waters of São Paulo. This Commission is coordinated by the State Secretariat for the Environment.

SMA was present and worked at COPs in India/2012, South Korea/2014 and Mexico/2016. In parallel, SMA's actions sought to fulfill the objectives of the targets, aiming at preserving and promoting the sustainable use of biodiversity for the benefit of present and future generations. In 2018, the State of São Paulo will participate in COP in Egypt, with a prominent role as a subnational government in relation to the implementation of the biodiversity agenda.

Table 3.23 shows the Aichi Targets and their respective official logos; Table 3.24 shows the programs/actions of the Environmental System of the state of São Paulo presented in this Chapter 4, relating them to the targets and their objectives.

TABLE 3.23
DESCRIPTION OF THE 20 AICHI TARGETS AND THEIR ASSOCIATED LOGOS

	Target	Description	Logo
1	Educating people about the value of biodiversity	By 2020, at the latest, people must be aware of the values of biodiversity and of what they can do to preserve it and to use it in a sustainable manner.	
2	Integrating the values of biodiversity into development	By 2020, at latest, biodiversity values must be integrated into national and local poverty reduction and development strategies and into planning processes; they must also be incorporated into the national accounting system, as the case might be, as well as into documentation and reporting systems.	
3	Eliminating harmful incentives and implementing positive incentives	By 2020, at the latest, incentives – therein included subsidizes – harmful to biodiversity must have been eliminated or reviewed, or in the process of being eliminated, in order to minimize or avoid negative impacts, and positive incentives for the conservation and for the sustainable use of the biodiversity must have been developed and applied in a manner consistent and in harmony with the Convention and other relevant international obligations, taking into consideration the national social-economic conditions	
4	Sustainable Production and Consumption	By 2020, at the latest, Governments, businesses and other stakeholders at all levels must have taken steps, or implemented plans for sustainable consumption and production and must have been able to restrict the impacts of the use of natural resources to ecological limits clearly safe.	
5	Reducing native habitat losses	By 2020, the rate of loss of all natural habitats, including forests, must have been reduced at least by 50% and, if possible, taken to zero; degradation and fragmentation must have been significantly reduced.	
6	Sustainable fishing	By 2020, all fish and invertebrate stock and aquatic plants management and capture must have become sustainable and legal and must be carried out based on the adoption of an eco-systemic approaches so that overfishing is avoided, plans and measures of recovery are implemented for all depleted species, fishing does not have significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fishing on socks, species and ecosystems are within safe ecological limits.	
7	Agriculture, fish farming and forestry sustainability	By 2020, areas under agriculture, aquaculture and forestry exploitation will be managed in a sustainable manner, ensuring the conservation of biodiversity.	
8	Water pollution control	By 2020, pollution including the one deriving from nutrient excess must have been reduced to levels not harmful to biodiversity and to ecosystems operation.	
9	Exotic alien species control	By 2020, exotic alien species and their vectors must have been identified and prioritized; priority species must have been controlled or eradicated and measures to manage vectors must have been adopted, preventing the introduction and the establishment of exotic alien species.	
10	Reducing pressure on coral reefs	By 2015, the multiple anthropogenic pressures on coral reefs and other ecosystems impacted by climate change, or ocean acidification, must have been minimized to keep the integrity and operation of such ecosystems	

	Target	Description	Logo
11	Expanding and implementing protected area systems	By 2020, at least 17% of the terrestrial areas and continental waters, and 10% of marine and coastal areas, especially areas of particular importance for the biodiversity and eco-systemic services, must be preserved by means of an equitable and efficient management systems, must be ecologically represented with well-connected systems for protected areas and other efficient measures of conservation based on the area and integrated to more ample terrestrial and marine landscapes.	
12	Avoiding species extinction	By 2020 the extinction of endangered species must have been halted, and the conservation situation of such species, particularly those undergoing deeper decline, must have been improved and maintained.	
13	Agrobiodiversity conservation	By 2020, the genetic diversity of cultivated plants and domestic animals and that of their wild counterparties, including other species with social, economic and cultural importance must be maintained, and strategies to minimize their genetic erosion and to protect their genetic diversity must be developed and implemented.	
14	Restoration of ecosystems providing essential services	By 2020, the ecosystems that supply essential services, including services related to water, and that contribute to health, feeding and well-being must be restored and protected taking into consideration the needs of women, indigenous populations and local communities, and those of the poor and the vulnerable.	
15	Recovery of degraded ecosystems to mitigate the effects of, and adapt to climate change	By 2020, the resilience of ecosystems and the contribution of biodiversity to carbon stocks must be amplified by means of conservation and restoration, including the restoration of at least 15% of degraded ecosystems, hence contributing to the mitigation of climate change effects and to the adaptation and fight against desertification.	
16	Implementation of the Nagoia Protocol	By 2015, the Nagoya Protocol on Access to Genetic Resources and on the Fair and Equitable Repartition of the Resulting Benefits of their use must be in full force and operation, constituting national legislation.	
17	Preparation and implementation of the National Biodiversity Strategy	By 2015, each Party must develop, adopt as a policy instrument, and initiate the implementation of an action plan and a participative, up-to-date national biodiversity strategy.	
18	Respect for indigenous populations and traditional knowledge	By 2020, traditional knowledge, innovations, and indigenous and local community practices relevant to the conservation and sustainable use of biodiversity, and the customary use of biological resources must be respected, subject to all relevant national legislation and to international obligations, and totally integrated into and reflected in the implementation of the Convention, with the complete and effective participation of the local and indigenous communities at all relevant levels.	
19	Science and technology for biodiversity	By 2020, knowledge, the science base and technologies related to biodiversity, its values, operation, status and tendencies, as well as the consequences of its loss, must be improved, and amply shared, transferred and applied.	
20	Mobilizing financial resources	By 2020, at the latest, the mobilization of financial resources from all sources for the effective implementation of the Strategic Plan for Biodiversity 2011-2020, and in compliance with a consolidated and agreed upon process in the Strategy for the Mobilization of Resources, must be substantially superior to current levels. This target is subject to changes deriving from the needs assessment for resources which will be prepared and reported by the Parties.	

Source and preparation: SMA/GT-Bio/CI-AINT (2018).

TABLE 3.24
PROGRAMS AND ACTIONS OF THE ENVIRONMENTAL SYSTEM OF THE STATE OF SÃO PAULO AND ITS RELATIONSHIP WITH THE AICHI TARGETS

Programs and Actions			Aichi Targets																		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Management of Contaminated Areas										x												
Atmospheric Emissions Control Plan	Plan for the Reduction in Emissions from Stationary Sources (PREFE)									x		x										
	Vehicular Pollution Control Plan (PCPV)									x		x										
Environmental Technical Councils			x	x	x	x				x									x			
State Program for Natural Disaster Prevention and Geological Hazard Reduction (PDN)																x	x					
Headwarters Program			x		x		x			x			x	x		x	x					x
Monitoring and Surveillance Programs for Biodiversity Conservation	Inspection Management	State Program for Environmental Conciliation	x				x	x	x				x	x		x	x					
		Electronic Environmental Infraction Report (AIA-e) and e-Ambiente Portal	x			x	x									x	x				x	
		Repair of Environmental Damage					x	x	x				x	x		x	x					
		Conversion of Fines in Environmental Services	x		x	x	x		x							x	x					x
	Inspection and Monitoring Strategic Actions	MAIS - Environmental Monitoring using Satellite Images					x						x	x		x	x					
		Integrated System for Conservation Unit Monitoring (SIM)					x	x	x				x	x		x	x					
		Environmental Inspection Plan for Integral Protection Conservation (SIM-UC)	x				x	x	x				x	x		x	x					
		Environmental Inspection Plan for Fishing Activities in Coastal Areas and in Marine APAs (SIMMAR)	x			x	x	x	x	x	x		x	x		x						
		Support Plan for the RPPN (SIM-RPPN)					x		x				x	x		x	x					
		Socio-Environmental Training Program	x					x	x				x	x		x	x			x		
		State System for Forest Fire Prevention and Fire Fighting - "Operação Corta Fogo"	x				x		x				x	x		x	x					
Management System of Protected Areas	Management Plan		x	x	x	x	x	x	x		x	x	x	x		x	x			x	x	
	State Program to support RPPN's (RPPN's Program of São Paulo)		x	x	x		x				x		x	x	x	x	x	x	x		x	x
	Restoration Actions in Conservation Units						x		x		x		x	x	x	x	x				x	
	Mosaics of Protected Areas		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Socio-Environmental Recovery Program of Serra do Mar and Mosaic Systems of Mata Atlântica Forest		x				x			x	x		x	x	x	x	x					
	Forest Foundation Environmental Education Program		x				x	x	x	x	x		x	x		x	x			x	x	
Ecological ICMS			x	x	x								x									x
Botany Institute Programs	Research		x								x				x	x	x			x	x	
	Teaching		x								x				x	x	x			x	x	
Sustainable Rural Development Project - Micro-Basins II - Market Access - (PDRS)			x	x	x	x	x		x	x					x	x	x			x		x
Economics of Ecosystems and Biodiversity Project of São Paulo (TEEB - São Paulo)			x	x															x		x	
Agro-environmental Protocols	Environmental Protocol for the Sugarcane Sector		x	x	x	x	x		x	x	x	x	x			x	x					
	Agro-Ecological Transition Protocol		x	x	x	x	x		x	x			x		x	x	x			x		
Cadmadeira			x			x			x													
Payment for Environmental Services (PSA)			x	x	x	x	x		x	x			x			x	x				x	x
Wild Fauna Management Actions	State Program for the Identification and Control of the Population of Dogs and Cats (PEICPCG)		x											x								
	Technical Guidelines to Monitor and Control the Brazilian Spotted Fever in the State of São Paulo		x																			
	Actions upon the impact of yellow fever on the populations of Non-Human Primates (PNHs)		x				x		x				x	x		x	x				x	
Environmental Education Actions			x				x	x	x	x	x		x	x		x	x			x	x	
State Program for Sustainable Public Procurement (PECPS)			x			x																
GreenBlue City Program			x	x			x			x			x	x		x	x		x			x
DataGEO			x																		x	
Cetesb's Programs in the International Environmental Agenda												x							x			

Source and preparation: SMA/GT-Bio/CI-AINT (2018).

ustainable Development Goals

At the United Nations Summit on Sustainable Development (September 2015), the leaders of Government and of State of 193 countries adopted the 2030 Agenda for Sustainable Development, which contains a set of 17 Sustainable Development Goals - ODSs (Figure 3.29).

In July 2016, the Government of the state of São Paulo, by means of Decree Nº 62,063, established the Inter-Secretariat Work Group (GTI), composed by the State Secretariat for Environment and other State Secretariats, under the coordination of the Chief of Staff Office International Advisory Board, with the purpose of implementing the Sustainable Development Goals (ODS) and internalizing the goals of the 2030 Agenda into the programs, plans and actions of the state secretariats.

FIGURE 3.29

SUSTAINABLE DEVELOPMENT GOALS

Source: UN [201-], prepared by SMA/CPLA (2018).

The ODSs were built based on the results of Rio+20 Conference and take into account the legacy of the Millennium Development Goals (ODM): eight goals to fight poverty that the world pledged to achieve by 2015.

Seeking to obtain advances in ODM's targets not achieved, ODSs seek to ensure human rights, end poverty, fight against inequality and injustice, achieve gender equality and women's and girls' empowerment, as well as address other challenges of our time.

ODSs are integrated and indivisible, and merge, in a balanced manner, the three dimensions of sustainable development: economic, social and environmental. They are also universal, which means that they apply to all countries in the world and should be achieved at the global, national and subnational levels.

Environmental Guidelines

The following are the main state environmental guidelines issued in 2017, which had the support or the participation of the Environmental System of the state of São Paulo.

Protected Areas

Resolution SMA Nº 03/2017

Addresses the approval of the Management Plan of Campos do Jordão State Park - PECJ, Nature Conservation Unit of Integral Protection, created by Decree - State Law Nº 11.908, dated March 27, 1941. State Official Gazette (DOE-I JAN/12//2017, p. 90/91).

Resolution SMA Nº 04/2017

Addresses the approval of the Management Plan of Campos do Jordão Watershed State Park - PEMCJ, Conservation Unit of Integral Protection, created by State Decree Nº 37.539, dated September 27, 1993. State Official Gazette (DOE-I JAN/19//2017, p. 47/48).

Resolution SMA Nº 08/2017

Recognizes the Private Reserve of Natural Heritage "Mata do Macacos", located in the municipality of Conchal/SP. State Official Gazette (DOE-I FEB/01/2017, p.44).

Resolution SMA Nº 88/2017

Addresses the procedures for the establishment of Consulting Councils at the conservation units managed by the departments and entities linked to the State Secretariat for the Environment, as well as for the appointment of their members and their representatives and deputies, and presents correlated measures. State Official Gazette (DOE-I SEPT/02/2017, p.81).

Resolution SMA Nº 93/2017

Establishes the Integration Committee of Management Plans, in order to establish guidelines and procedures for the preparation, review and implementation of the Management Plans of State Conservation Units, and presents other measures. State Official Gazette (DOE-I SEPT/07/2017, p.46).

SMA Resolution Nº 118/2017 (amended by Resolution SMA Nº 134/2017)

Establishes the Work Group to develop studies and propose actions for the protection, conservation and sustainable development of Serra da Mantiqueira. State Official Gazette (DOE-I OCT/03/2017, p.62).

Resolution SMA Nº 146/2017

Establishes the Biome Maps of the State of São Paulo, and presents other measures. State Official Gazette (DOE-I NOV/10/2017, p.42).

Resolution SMA Nº 162/2017

Establishes the Integration Committee on Public Use, in order to set guidelines and procedures for the development of the public use of urban parks and conservation units, managed by the State Secretariat for the Environment and its related entities, and presents other measures. State Official Gazette (DOE-I DEC/20/2017, p.90).

Vegetation Removal

Resolution SMA Nº 07/2017 (as amended by Resolution SMA Nº 20/2017)

Addresses the criteria and parameters for environmental compensation of areas object of request for authorization to suppress native vegetation, to cut individual trees and to intervene in Permanent Preservation Areas in the State of São Paulo. State Official Gazette (DOE-I JAN/20/2017, p.54/57).

Resolution SMA Nº 72/2017

Addresses the procedures for the analysis of requests to suppress native vegetation aimed at land divisions (development or splitting)., condominiums or any building in an urban area, and for the establishment of permeable area within the urban area for those cases which it specifies. State Official Gazette (DOE-I JUL/20/2017, p.124).

Water Resources

Joint SES/SMA/SSRH Resolution Nº 01/2017

Governs the direct reuse of non-drinkable water, for urban purposes, resulting from Sanitary Sewage Treatment Stations, and presents correlated measures. State Official Gazette (DOE-I JUN/06/2017, p.41/42).

Fauna

Decree nº 62.838/2017

Establishes the Evaluation Commission to assess compliance with Federal Law nº 11.794, dated October 08, 2008, as well as the resolutions and ordinances issued by the National Council for Animal Experimentation Control - CONCEA at level of the state of São Paulo. State Official Gazette (DOE-I SEPT/28/2017, p.3).

Resolution SMA Nº 23/2017

Establishes the conditions for the exceptional use of Uça crab (*Ucides cordatus*). State Official Gazette (DOE-I MAR/23/2017, p.35).

Resolution SMA Nº 152/2017

Establishes the Work Group responsible for the coordination of technical studies of capybara and wild boar populations, their interactions with human populations, and the zoonotic and environmental impact in the state of São Paulo. State Official Gazette (DOE-I NOV/29/2017, p.57).

Aquaculture

Joint Resolution SMA/SAA Nº 02/2017

Addresses the establishment of the Technical Work Group to analyze the methodologies and the frequency of water monitoring in the context of aquaculture environmental licensing. State Official Gazette (DOE-I MAY/25/2017, p.43).

Watershed Areas

Law Nº 16.568/2017

Addresses the Protection and Recovery Area of Alto Cotia Watershed Areas- APRM-AC, its Intervention Areas, guidelines and environmental and urban standards of regional interest for the protection and recovery of watershed areas. State Official Gazette (DOE-I NOV/11/2017, p.1).

Resolution SMA Nº 21/2017

Regulates environmental licensing of Recovery Programs of Social Interest - PRIS and of Housings of Social Interest - HIS, linked to the Recovery Programs of Social Interest - PRIS, under state law regarding the Protection and Recovery of Watershed areas. State Official Gazette (DOE-I MAR/10/2017, p.51/52).

Headwaters Program

Decree Nº 62.914/2017

Reorganizes the Incentive Program for the Recovery of Riparian Vegetation and the Recomposition of Vegetation at Basins Constituent of Watershed Areas - Program Headwaters - and presents related measures. State Official Gazette (DOE-I NOV/09/2017, p.4).

Resolution SMA Nº 142/2017

Establishes the Payment for Environmental Services Project - PSA Mata Ciliar, in the context of the Sustainable Rural Development Project - PDRS. State Official Gazette (DOE-I NOV/08/2017, p.75/76).

Resolution SMA Nº 157/2017

Sets the pre-requirements for the approval of ecological restoration projects, and presents other measures for the implementation of the Headwater Program, object of Decree Nº 62914, dated November 08, 2017. State Official Gazette (DOE-I DEC/08/2017, p.84).

Joint Resolution SMA/SAA Nº 05/2017

Establishes criteria and procedures for the implementation of joint actions in the context of the Project for the Recovery of Riparian Forests, Headwaters and Water Streams. State Official Gazette (DOE-I NOV/142017, p.46/47).

Solid Waste

Resolution SMA Nº 117/2017

Establishes the conditions for municipal landfill licensing in the State of São Paulo, and presents correlated measures. State Official Gazette (DOE-I SEPT/30/2017, p.54).

Resolution SMA Nº 151/2017

Establishes, within the scope of the State Secretariat for the Environment, the Integration Committee on Solid Waste, and presents other measures. State Official Gazette (DOE-I DEC/01/2017, p.67).

Contaminated Areas

Resolution SMA Nº 10/2017

Addresses the definition of activities potentially prone to generating contaminated areas. State Official Gazette (DOE-I FEB/10/2017, p.43).

Resolution SMA Nº 11/2017

Addresses the definition of priority areas for the identification of contaminated areas. State Official Gazette (DOE-I FEB/10/2017, p.43/47).

Environmental Regularization

Resolution SMA Nº 46/2017

Addresses the analysis of rural environmental records and any environmental liabilities while the Program of Environmental Regularization - PRA remains pending implementation in the State of São Paulo. State Official Gazette (DOE-I JUN/09/2017, p.49).

Environmental Education

Resolution SMA Nº 33/2017

Establishes the Integration Committee on Environmental Education in order to coordinate and monitor environmental education actions developed within the Environmental System of the state of São Paulo. State Official Gazette (DOE-I MAY/13/2017, p.53).

Zoning

Decree Nº 62.913/2017

Addresses the Ecological-Economic Zoning of the Northern Coast Sector, and presents correlated measures. State Official Gazette (DOE-I NOV/09/2017, p.1).

Inspection

Resolution SMA Nº 81/2017

Addresses the establishment of causal relationship between inspection and sanction regarding the irregular use of fire in agropastoral areas. State Official Gazette (DOE-I AUG/19/2017, p.58).

Licensing

Decree Nº 62.973/2017 (amended by Decree nº 63.119/2017)

Brings new wording to articles set forth in the Regulations of Law Nº 997, dated May 31, 1976, approved by Decree nº 8.468, dated September 8, 1976, which addresses environmental pollution prevention and control, and to articles of Decree Nº 47.400, dated December 4, 2002, which regulates the provisions of Law nº 9.509, dated March 20, 1997, regarding environmental licensing. State Official Gazette (DOE-I NOV/29/2017, p.1).

Resolution SMA Nº 38/2017

Establishes guidelines and conditions for licensing and operation of the energy recovery activity resulting from the use of Fuel Derived from Urban Solid Waste - CDRU in Clinker Production Furnaces. State Official Gazette (DOE-I JUN/02/2017, p.48/49).

Resolution SMA Nº 74/2017

Addresses the environmental licensing of plants for electric generation by photovoltaic solar power. State Official Gazette (DOE-I AUG/05/2017, p.69).

Other

Decree nº 62.682/2017

Establishes and organizes, in the scope of the State of São Paulo, the Management State Unit for the Recovery and Protection of Biodiversity and Climate-Related Services in the Southern Corridor of Brazil'S Mata Atlântica - Project Climate and Biodiversity in Mata Atlântica, and presents correlated measures. State Official Gazette (DOE-I JUL/08/2017, p.3).

Resolution SMA Nº 86/2017

Establishes the Project for Environmental Services Payment for Protection of Native Vegetation - PSA PROTEÇÃO, within the scope of the Project on Climate and Biodiversity in Mata Atlântica Forest. State Official Gazette (DOE-I AUG/26/2017, p.47/48).

Joint Resolution SMA/SAA Nº 04/2017

Establishes the Executive Group to monitor the Intentions Protocol which defines actions to overcome the challenges brought about by the mechanization of sugar cane harvesting and the consolidation of sustainable development in the sugar cane energy sector in the State of São Paulo and presents other measures. State Official Gazette (DOE-I NOV/11/2017, p.60).

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DE SÃO PAULO

Secretaria de Infraestrutura
e Meio Ambiente