

## **(2) Training for Administration Tools for Wise Use of Wetlands**

Administration has many legislative tools for environmental protection such as Federal laws and ordinances at State and municipality levels. For example, EIA and zoning systems like Areas for Environmental Protection (APA) and RPPN are among them. It is often the case, however, that government officials do not have sufficient knowledge on their tools. In particular, it is so when such legislation does not belong to their own organizations or divisions. This project aims at upgrading capacity of government officials so that they can have rich background knowledge on legal and administrative tools, in particular, land use, conservation and management of protected areas.

### **1) Targets**

Annually 20 staff members of State government and municipalities

### **2) Course curricula**

- Lecture on administrative tools
  - Federal and State environmental laws and regulations
- Lecture on wise use
  - Developing and implementing wetland policies
  - World laws and institutions to promote the conservation and wise use
  - Integration of conservation and wise use into river basin management
  - Local communities' participation in the management of wetlands
  - Promoting wise use by communication, education and public awareness
  - Management of Ramsar sites and other wetlands
  - Modalities of international cooperation
  - Latest strategy of the Ramsar Convention
- Exercise
  - Case studies on application of laws
  - Success and failure stories in other places and countries

- Inspection

Environmental facilities (e.g. sewage treatment facility)

### **3) Training material**

Ramsar handbooks for the wise use of wetlands

### **(3) Training for Environmental Leadership**

Interests of different sectors in recent environmental issues tend to become more diverse and complicated, and therefore high ability of problem solving is required for stakeholders. It is particularly the case for participatory decision-making, and high ability of explanation and facilitation is required for those who play a moderator's role in the discussion. Presently, however, such training opportunities are lacking for any sectors. This course is intended to give such training opportunities to officials of State and municipalities, NGOs and potential leaders of next generation. Participants are expected to acquire accountability necessary for dialogue with varied sectors as well as coordination skills for bringing different opinions to conclusion.

#### **1) Targets**

Annually 30 staff members of State government and municipalities who have opportunities of dialogue with local people, community leaders, NGO staff and students.

#### **2) Course curricula**

- Presentations:

Introduction to leadership (from managers to facilitators)

Roles of autonomies, businesses, NGOs,

Success and failure stories

Concept of partnership

## Local Agenda 21

- Group work
  - Presentation techniques
  - Facilitation techniques
  - Case trainings

### **9.2.3 International Exchange**

It is proposed to convene two international conferences within the framework of this project. One should be held as “Conference on MAR-DE-DENTROs of the World” before commencement of these projects for the purpose of drawing local people’s attention to lakes and wetlands. The other should be held as “International Conference on Conservation and Management of Lakes (World Lake Conference)” during the project implementation stage so that the project outputs are visible to the world. These conferences are beneficial in reflecting world experiences to the management of lakes and wetlands of this area.

#### **(1) Conference on MAR-DE-DENTROs of the World**

In the world there are numbers of lagoon-type lakes that are brackish and connected to the sea. For example Chilika Lake (India), Songkhla Lake (Thailand), Laguna de Bay (Philippines), Lake Kasumigaura (Japan) and Lake Nakaumi (Japan) are among them. Those lakes are commonly rich in both biodiversity and biological productivity due to brackishness of water. Those lakes have served as good fishery ground and surrounding humid lands served as good place for agriculture (mainly rice production). Moreover, because of rich aquatic biota, those lakes also provide waterbirds with ideal habitats, and many lakes have been designated as Ramsar sites.

However, due to the shallowness of lake water and high economic activities in and around the lakes, those lakes are susceptible to environmental changes and surprisingly large number of lagoon-type lakes have been suffering from environmental degradation such as: eutrophication, siltation, fish decrease by over-fishing, and loss of biodiversity. Because those problems are common to those lakes, it is necessary for stakeholders of those lakes to learn experiences (success and failure stories) of other lagoons of the world.

## 1) Objectives

This project aims at promoting sustainable use of lagoon-type lakes through exchange of experiences at similar type lakes in the world.

- Sustainable inland fisheries (including agriculture and shrimp fishery) and lake water quality.
- Eco-tourism development.
- Rehabilitation of biodiversity and Ramsar Convention.
- Environmental Education and capacity building of relevant people.
- Sedimentation (including erosion of catchment areas) and navigation issues.
- Salinity control.

## 2) Participants

1,000 domestic and 80 overseas participants from following sectors:

- Administrators, Fishermen, Scientists, Industries (Fishery and Agriculture), Local people and Students

### (2) “International Conference on Conservation and Management of Lakes”

Starting from Lake Biwa of Japan in 1984, this conference has been held biannually elsewhere in the world. This conference has comprehensive nature and is not inclined to a certain scientific field. It is a place of dialogue between 1) citizens, 2) administration, 3) scientists and 4) business sectors. Since agriculture has not been dealt in the foregoing conferences, this could be an appropriate topic for this area, under the participation of 2,000 domestic and 200 overseas experts and citizens. Proposed topics for the Conference are:

- Lakes/Wetlands and agriculture
- Lakes/Wetlands and fishery
- Participatory lake management in agricultural area

## **9.3 Institutional Framework for Conservation of Wetlands and Ecosystem**

### **9.3.1 Project Implementation**

As shown in **Fig. 9.3-1**, five conservation projects should be borne by different agencies in SEMA. Mar-de-Dentro Secretariat is responsible for coordination among relevant sectors and financial arrangements of respective projects. Cooperation of municipalities, NGOs, Universities and federal agencies (e.g. IBAMA and EMBRAPA) is necessary in addition to other sectors of State government.

As for the Wetland awareness and capacity building project, presently there is no appropriate implementation agency, and it is proposed to establish a new project office under SMA. The staff is mainly composed of a few full proper staff and secondment staff from SCP, SEMA, municipalities, and educational sectors.

### **9.3.2 Establishment of Wetland Committee**

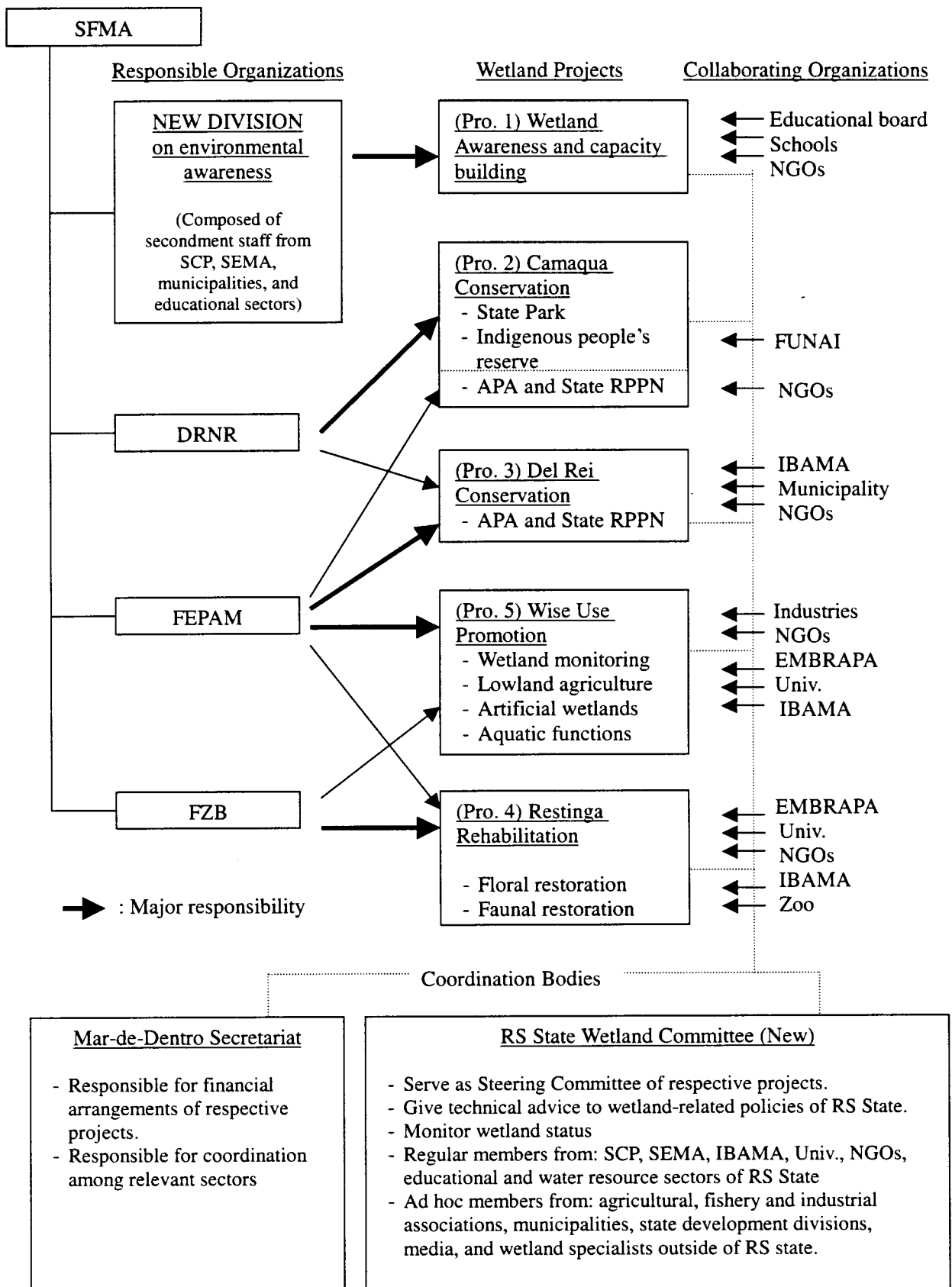
At state level, there is no specialized department for wetland conservation. In view of the importance of wetlands in this region, establishment of a Wetland Committee is proposed for the following:

Members:

- Regular members from: SCP, SEMA, IBAMA, Universities, NGOs, educational and water resource sectors of Rio Grande do Sul State,
- Ad hoc members from: agricultural, fishery and industrial associations, municipalities, state development divisions, media, and wetland specialists outside of Rio Grande do Sul State.

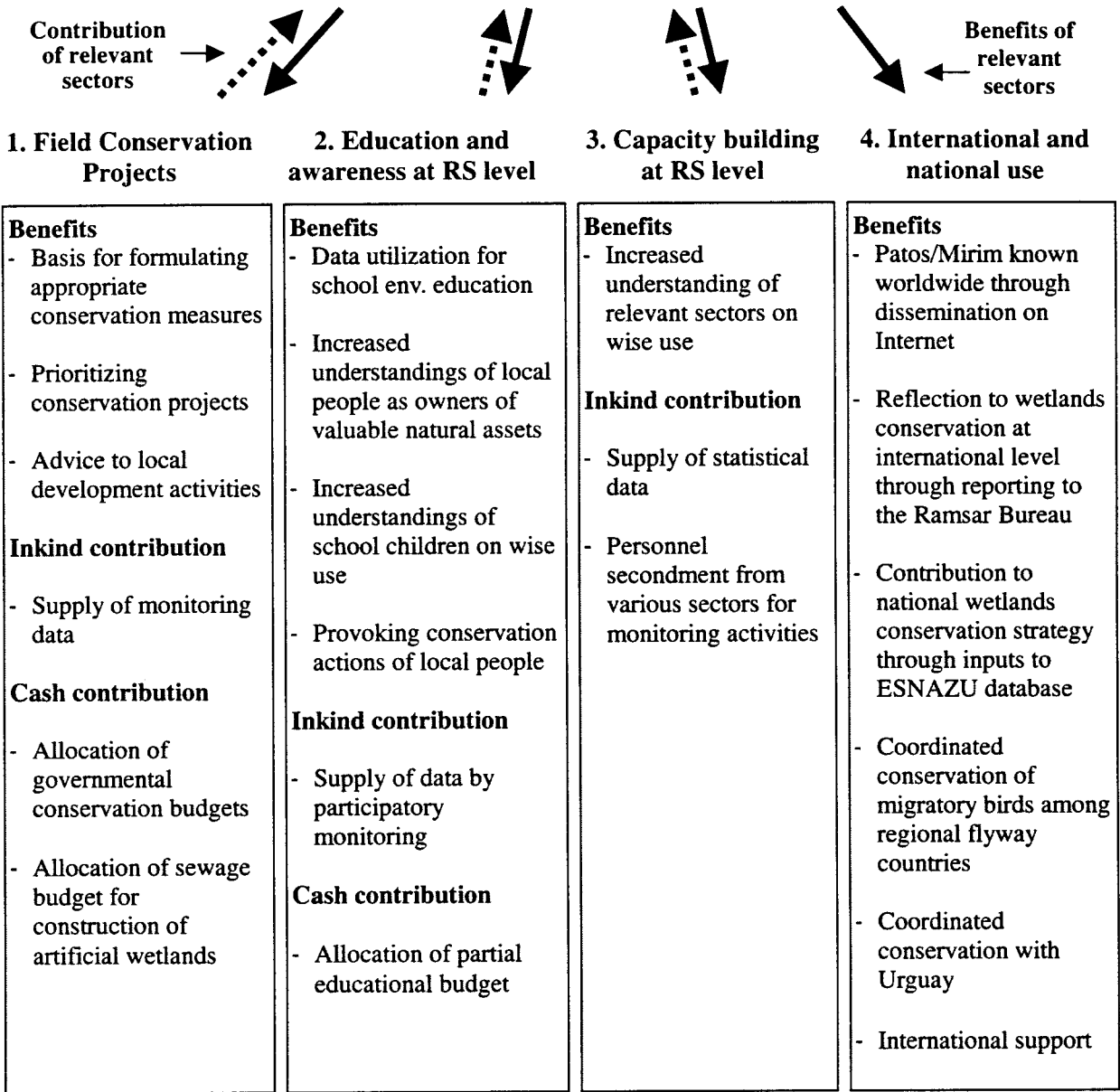
Terms of reference:

- Give technical advice to wetland-related policies of Rio Grande do Sul State,
- Serve as Steering Committee of respective projects in the Wetland and Ecosystem Conservation Master Plan,
- Monitor wetland status (relevance of monitoring activities with conservation projects are shown in **Fig. 9.3-2**) under the cooperation of relevant agencies)
- Make coordination with national level wetland policies



**Fig. 9.3-1 Organization Chart for Implementation of Wetland and Ecosystem Conservation Plan**

- 1. Data Collection**
- Data items based on Ramsar Information Sheet (Natural, hydrological and socio-economic data)
  - Cooperation of NGOs in field data collection
  - Cooperation of various government agencies in supplying statistical data
- 2. Data Compilation and valuation**
- Compatible data format with the planned GIS Data Bank of the Brazilian National Wetlands Strategy (ESNAZU)
  - Use of GIS (if financially possible)
- 3. Data Dissemination**
- Use of Web site
  - Annual Paper Report



Purposes of monitoring and modalities of cooperation

Fig. 9.3-2 Information System for Wetland Monitoring

## 9.4 Zoning and Guidelines for Wise Use of Wetlands

### 9.4.1 Zoning

Evaluation of wetland values in the study area (refer **9.1-2**) revealed that zoning in Mata Atlântica Biosphere Reserve program is applicable also for wetland conservation because important wetlands identified in **Table 9.1-2** mostly coincide with the nuclear zone of the former. Presently, large coastal nuclear zones are already protected by Lagoa do Peixe National Park and Taim Ecological Station. Inner nuclear zones around Patos and Mirim lakes, however, have few conservation measures. By promoting conservation project for important wetlands at Camaqua, Del Rei, Canal de Sao Goncalo and Lagoa Pequena, most of nuclear zones of the Mata Atlântica Biosphere Reserve can be placed under environmental management plans.

As protection measures for the above areas, application of APA and RPPN is recommended because of their participatory characters (**Table 9.4-1**). Citizen movement to established APAs should be supported. Presently the number of RPPN is limited, because 1) incentives are insufficient, 2) manpower of IBAMA is limited and 3) procedures are complicated. For popularizing RPPN, more flexible and decentralized system is necessary. It is proposed to establish state level legislation on RPPN with following characters:

**Table 9.4-1 Protection options**

	Economic Activities	Participatory Management
PARNA (National Parks)	×	×
EE (Ecological Stations)	×	×
REBIO (Biological Reserves)	×	×
FLONA (National Forest)	×	×
APA (Areas for Environmental Protection)		
AEIE (Areas of Relevant Ecological Interest)	×	×
RPPN (Private Reserves of Natural Partimony)	×	
Proposed State RPPN (new)		

- To give more incentives to collaborators are necessary. Not only economic incentives but also social commending system may be sought.
- To admit a RPPN type with specified duration (e.g. 25 years).



- To admit a RPPN type at which more economic activities is possible.

#### **9.4.2 Guidelines**

Wetland and ecosystem conservation guidelines with target years of 2010 and 2020 are shown in **Table 9.4-2**. Total area of wetlands should be protected by no net loss policy. When a wetland has to be converted, compensatory wetland creation is requested. For fauna and flora, degradation of fauna and flora are prevented by 2010, and restoration of already lost ecosystems comes into scope by 2020. Old trees should be protected regardless of zones they belong to.

**Table 9.4-2 Wetland and Ecosystem Conservation Guidelines  
and Necessary Works**

Target groups		Target year	
		2010	2020
Wetland waters	Wetland area	No net loss	No net less
	Water level	Maintain ecologically sound levels at important wetlands	Maintain ecologically sound levels at other wetlands
	Water quality	Prevent inflow of harmful substances, e.g. agro-chemicals, heavy metals at important wetlands	Prevent inflow of harmful substances including environmental hormones
Plants	Riparian forests	Maintain present areas and biodiversity	Increase the area to strengthen corridor functions
	Restinga and other watershore vegetation	Research on the status in the past and at present	Restore restinga vegetation at places where it was already lost
	Endangered species	Survey present status	Take specific protection measures
	Old trees	Survey present status Prohibit cutting trees older than 200 years regardless of their location	Restrict cutting of trees older than 100 years regardless of their location
Mammals	Endangered species	Survey present status	Restore already disappeared population from this area
	Game species	Survey present status	Increase the population
	Marine species	Survey present status	Protection through awareness and water quality improvement
Birds	Waterbirds	Register Del Rei wetland and neighboring areas as Ramsar site.	Further improve the habitat conditions
	Other species	Survey present status	Protection through habitat conservation
Fishes		Survey present status Secure important places for nursery and spawning	Further increase spawning and nursery places
Awareness	Field visit	Realize field experience of 1,000 core group members annually	Realize field experience of 15,000 children annually
	Training	Promote capacity building	-
	International Enchage	Convvene two conferences	-

## 9.5 Conservation Projects for Important Wetlands

### 9.5.1 Camaqua Riparian Forest Conservation Project

Camaqua Riparian Forest is the largest Atlantic Forest remaining in the lowland area. It has rich floral biodiversity including endangered species. Bird species are also rich and nearly 300 species can be observed in a day. Although a part of the forest is designated as a state park, management plan has not been formulated.

#### (1) Objectives

- Prevent degradation of the riparian forest and restore it.
- Promote educational use
- Ensure its importance as habitat of varied animals species

#### (2) Project components

1) To cover the area (**Fig. 9.5-1**) with State Park, Indigenous People's Reserve, APA and RPPN. The most important delta area is covered by State Park, and the area is already gazetted. FUNAI is also already established at midstreams. APA and RPPN cover the upper area. Exact classifications depend on negotiation with landowners.

- Regular meetings with landowners are continued and incentive measures to them are explored.

2) To acquire land for Camaqua State Park and fence it appropriately to prevent invasion of cattle.

3) To establish "Camaquã Field Study Base" (along BR-116)

This is a base of bus field trips to wetlands and places in **Table 9.2-2**. The building is also used as a management office of Camaquã State Park. This center has following functions:

- Simple accommodation for group visitors
- Display and lecture facilities on ecosystems of Camaqua Riparian Forest

- 4) To construct field facilities
  - Improvement of ferry facilities
  - Boat trip and observation facilities for group visitors
  - Nature trails
  - Outdoor recreational facilities at river mouth
- 5) To promote research
  - Research on forest restoration.
  - Research on flooding for maintenance of the riparian forest.

### **9.5.2 Del Rei Wetland Conservation Project**

Del Rei is among the largest wetlands in this area with a landscape of native wetland. Although the area has been encroached by agricultural activities for many years and the water is used for irrigation, it still has high conservation value. Because of bad accessibility, however, Dei Rei wetland is scarcely known even to local people.

#### **(1) Objectives**

- Prevent riparian forest degradation and shrinking caused by agriculture.
- Promote educational use
- Ensure its functions as habitat of varied birds and animal species

#### **(2) Project components**

- 1) To cover the area (**Fig. 9.5-2**) with RPPN on the condition that sustainable intake of irrigation water is guaranteed or APA.

- 2) To designate the area as Ramsar site  
The site satisfies Ramsar criteria. It is also desirable to designate Taim Ecological Station at the same time.  
By realizing this, a Ramsar site corridor is formulated (Lagoa do Peite, Park Taim, Del Rei and d’Leste Wetland in Uruguay) along the Atlantic flyway.
- 3) Agreement with agricultural sectors on the sustainable water use.
  - Guidelines of sustainable water use
  - Awareness activities to landowners of the area.
  - Incentive measures to landowners of the area.
  - Research on desirable water use scheme.
- 4) Establishment of “Taim / Del Rei Ramsar Center” along BR-471 near Taim Ecological Station. (Due to bad accessibility of the actual site, the Center is placed at a convenient place. Although Taim Ecological Station is closed to the public, excellent ecology can be easily observed from the Center and construction of such a facility will be possible in cooperation with IBAMA.) This center has following functions:
  - Simple accommodation for group trips,
  - Display on ecosystems of Taim and Del Rei,
  - Display on Ramsar and wetland wise use (success stories of the world)
  - Arrangement of guided visit to Del Rei
  - Ordinary road service facilities (e.g. restaurants, petrol station)
- 5) Establishment of field facilities
  - Road access improvement to Del Rei wetland
  - Boat trip facilities
  - Observation facilities for birds and wetlands.

### 9.5.3 Restinga Rehabilitation Project

Degradation of wetland ecosystems at the study area is most serious in 'Restinga', water-shore vegetation characteristic to temperate lowland wetlands. Although it is a place of biodiversity, most of such places already disappeared due to agricultural development. This is especially the case with Patos Lake basin.

#### (1) Objectives

- Protect wetlands along Canal de Sao Goncalo by APA and RPPN
- Provoke people's attention on conservation needs of restinga and forests
- Promote research on rehabilitation of wetland fauna and flora
- Implement actual vegetational rehabilitation at selected places

#### (2) Project components

- 1) To cover the area (**Fig. 9.5-3**) with APA and RPPN. The area partially includes riparian forest of Piratini river. Southern end of the boundary is arbitrary.
- 2) To establish "Restinga Rehabilitation Center" at a RPPN of EMBRAPA along Canal de São Gonçalo. A restinga botanical garden is attached. Permanent Preservation Forest of UFPEL can be substantially a part of visiting place as it is located nearby. This center is mainly for display purpose. Actual rehabilitation studies will be done at collaborating research institutes.
- 3) To promote study on:
  - Rehabilitation of watershore vegetation (for example by fencing such area)
  - Re-introduction of already disappeared animal species

### 9.5.4 Wetland Wise Use Project

Lagoa Pequena is among most heavily used places in Patos Lake, and wise use is actually needed. Degradation of wetland ecosystems at the study area is most serious in

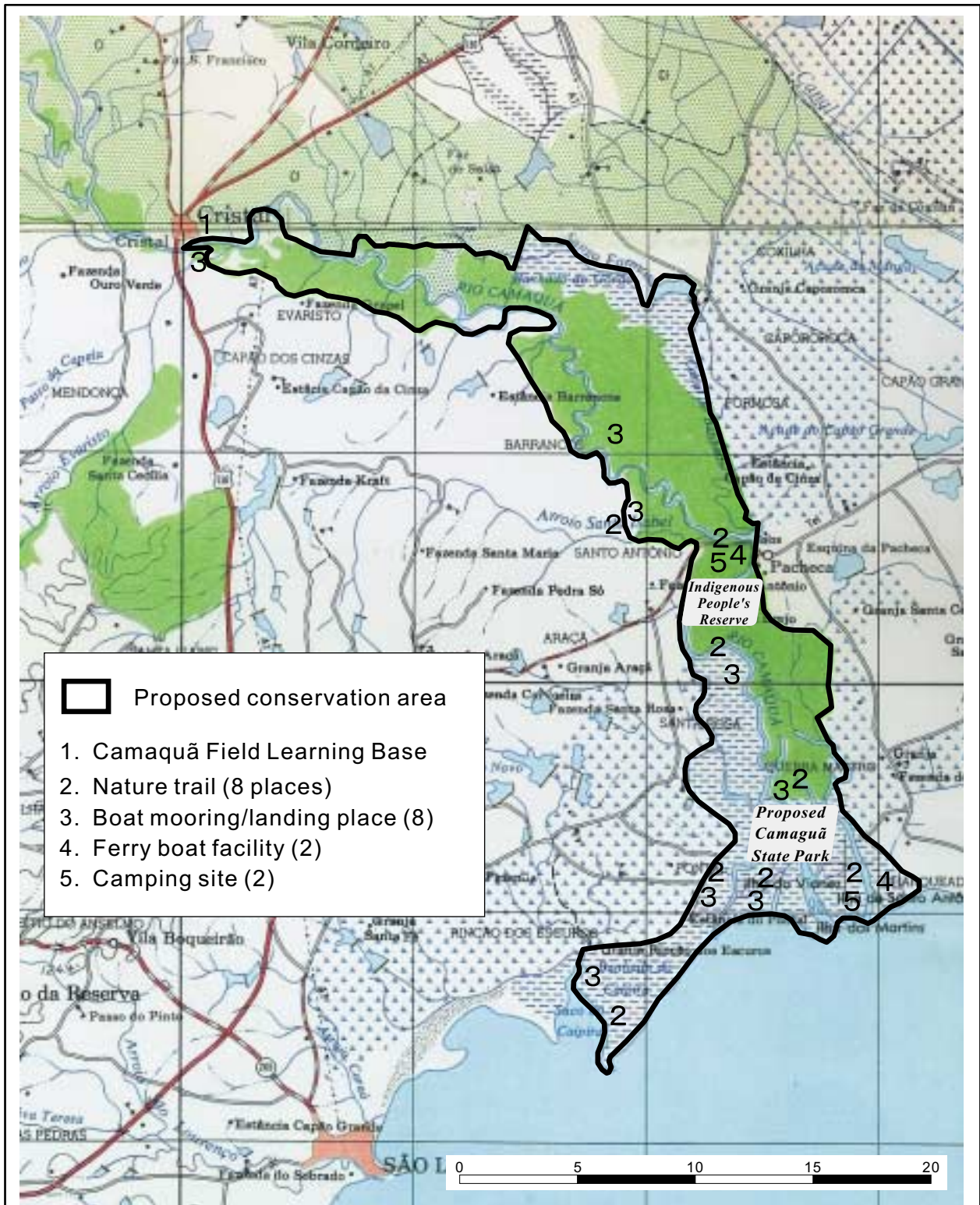
‘Restinga’, water-shore vegetation characteristic to temperate lowland wetlands. Although it is a place of biodiversity, most of such places already disappeared due to agricultural development. This is especially the case with Patos Lake basin.

**(1) Objectives**

- Protect wetlands at Lagoa Pequena by APA and RPPN
- Provoke people’s attention on underwater ecosystems
- Promote research on wise use of wetlands
- Promote fishermen’s capacity building.

**(2) Project components**

- 1) To cover the area (**Fig. 9.5-4**) with APA and RPPN. This project is aimed at only most important places, and this does not contradict with already existing APA that is going to cover much larger areas reaching BR-116.
- 2) To establish “Lake/Wetland Wise Use Center” at a fishermen’s colony of Z3. This is a small facility for meeting purpose, and the management is entrusted to local community. It is used as:
  - A base of boat trip to observe nature of Lagoa Pequena
  - Training of fishermen
  - Learning of sustainable resource by using examples of fishery.
- 3) To promote studies (actual rehabilitation studies will be done at collaborating research institutes) on:
  - Sustainable cattle farming in wetlands (e.g. permissive level of cattle invasion).
  - Ecological functions of artificial wetlands (such as those for wastewater treatment)
  - Wetland functions for fishery and underwater ecosystem.



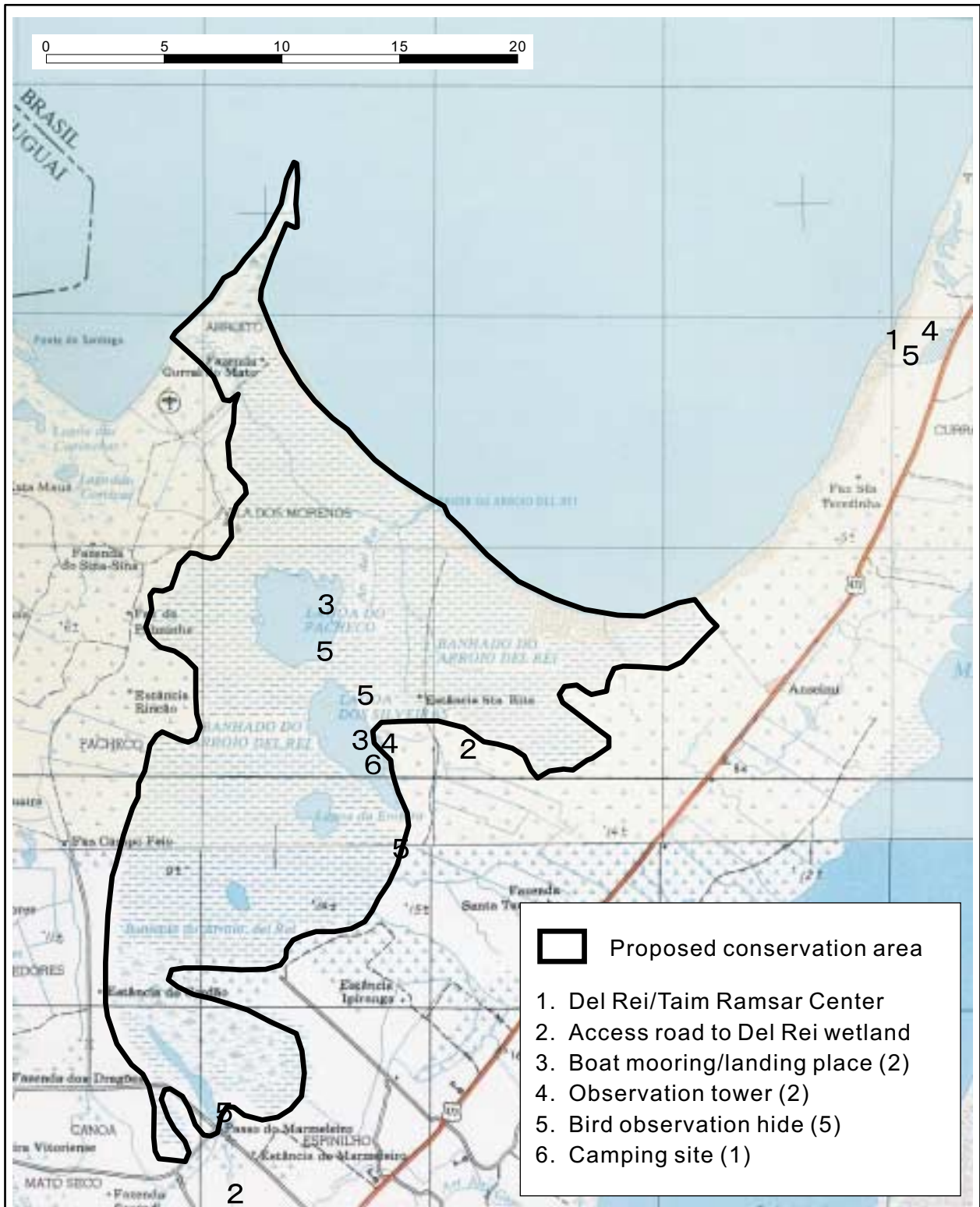
THE STUDY ON THE ENVIRONMENTAL MANAGEMENT  
OF THE HYDROGRAPHIC BASIN OF PATOS AND MIRIM LAKES  
IN THE FEDERATIVE REPUBLIC OF BRAZIL

**Fig. 9.5-1**

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**Proposed Area and  
Facilities for Camaguã  
Riparian Forest  
Conservation**



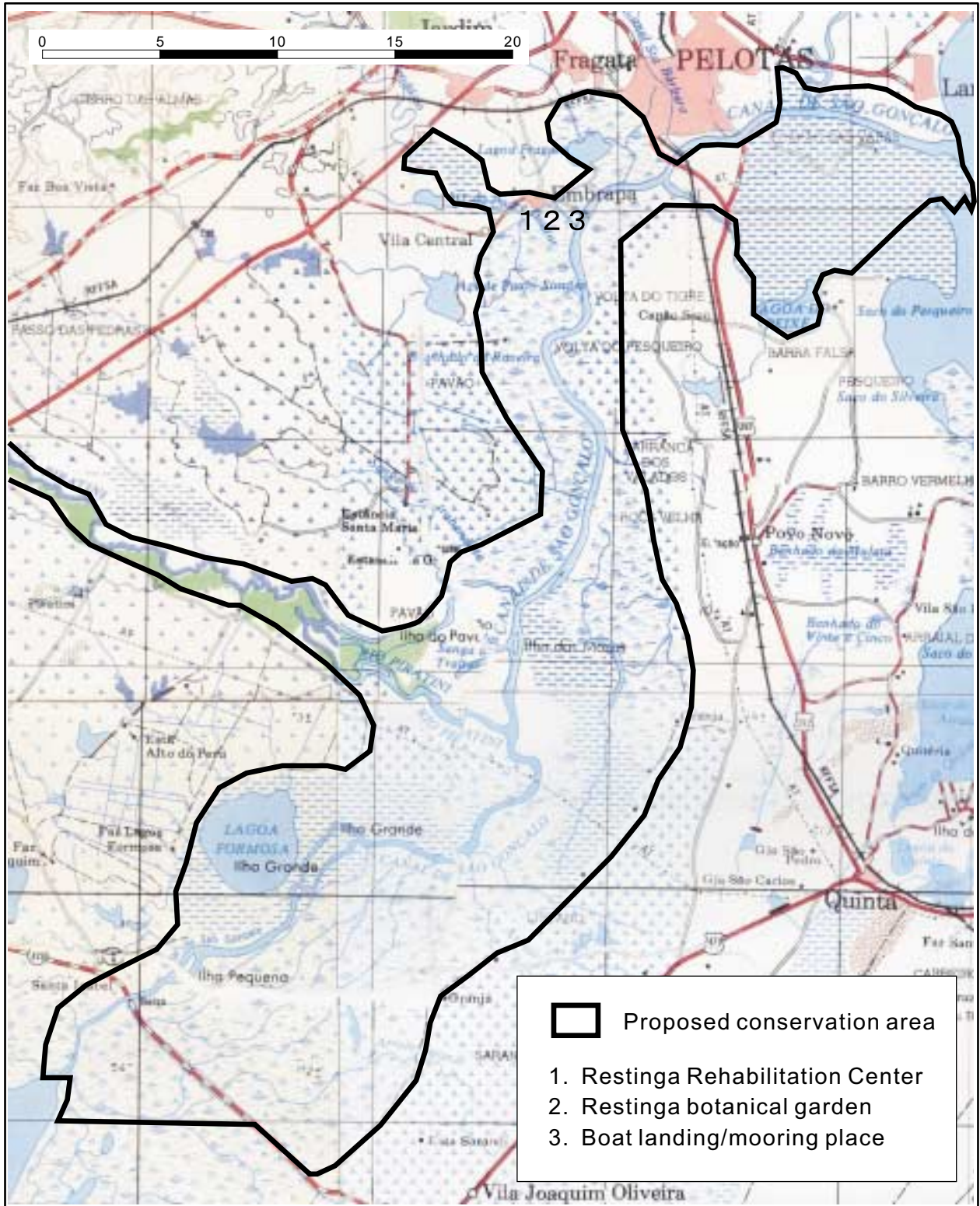


THE STUDY ON THE ENVIRONMENTAL MANAGEMENT  
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**Fig. 9.5-2**

**Proposed Area and  
Facilities for Del Rei  
Wetland Conservation**



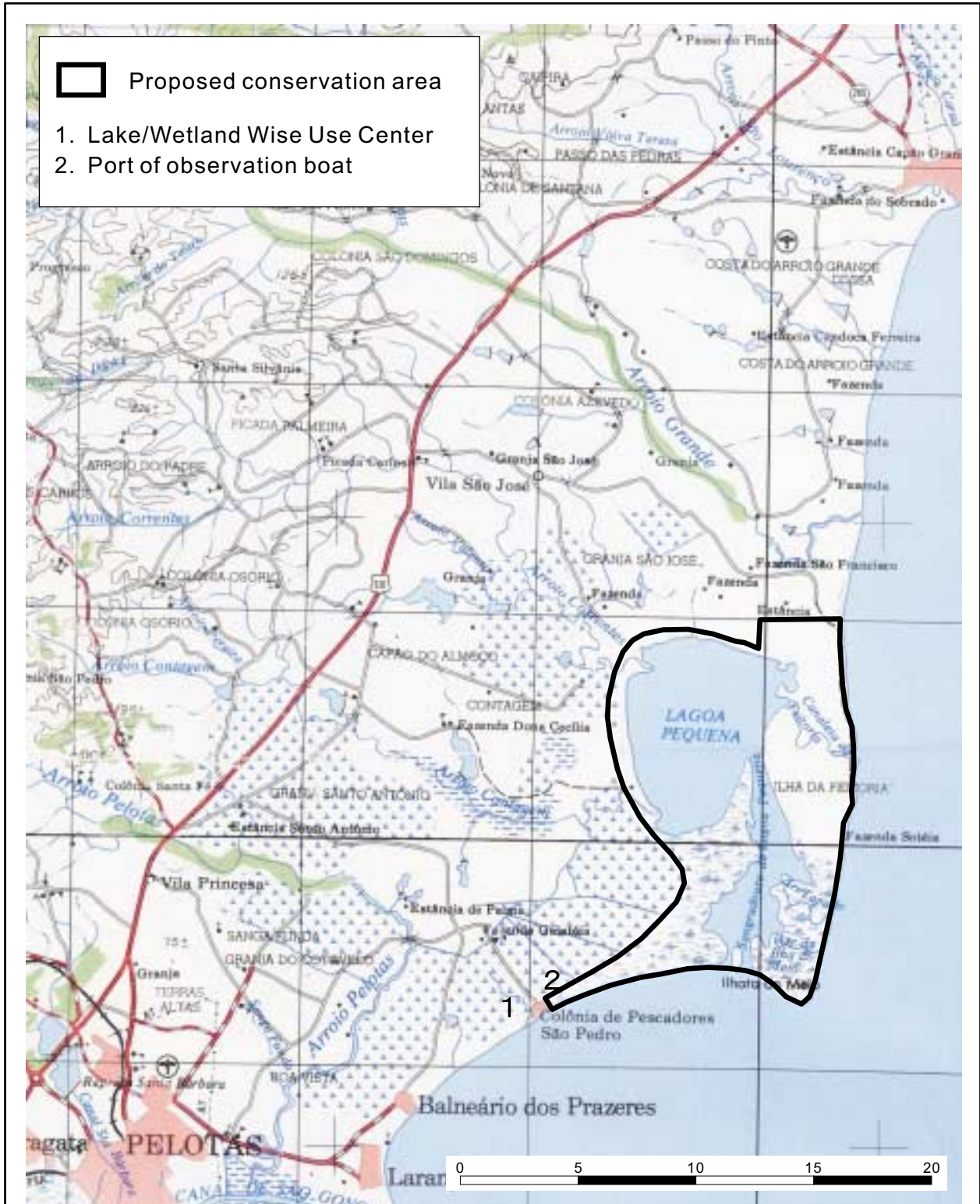
THE STUDY ON THE ENVIRONMENTAL MANAGEMENT  
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**Fig. 9.5-3**

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**Proposed Conservation  
Area and Facilities at  
Canal de Sao Goncalo**





THE STUDY ON THE ENVIRONMENTAL MANAGEMENT  
OF THE HYDROGRAPHIC BASIN OF PATOS AND MIRIM LAKES  
IN THE FEDERATIVE REPUBLIC OF BRAZIL

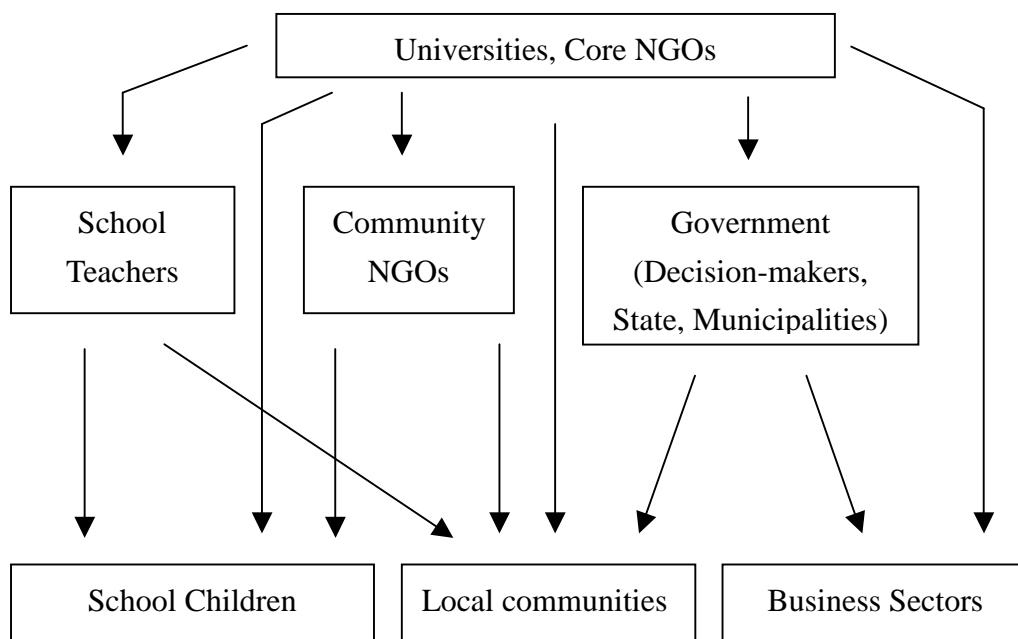
**Fig. 9.5-4**

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**Proposed Conservation  
Area and Facilities  
at Lagoa Pequena**

## 9.6 Involvement of NGOs in the Conservation of Wetland Ecosystems

One of obstacles in promoting awareness is a lack of human resources who can serve as instructors. It is not possible to secure qualified personnel from the administrative sector, and it is indispensable to have cooperation of environmental NGOs for promoting those programs. NGOs are not limited to environmental citizen groups, but include business associations (e.g. fishermen's association) and community-based groups. They can be involved as instructors of awareness project, implementers of monitoring activities, and managers of field facilities.



**Fig. 9.6-1 Role of NGOs in the Framework of Extension Activities**

In the study area, the number of NGO members is still not enough to fill the above demand. A multiplying mechanism is necessary, that is, core NGOs (e.g. NEMA) and universities (e.g. environmental education program of FURG) foster environmental knowledge of school teachers, community NGOs and government sectors, and then the latter teach larger target groups (Fig. 9.6-1). Modalities of the first step are mainly seminars and training courses. In the second step, leadership in field activities, publication of awareness materials, and demonstrations (e.g. exhibition at agricultural festivals) are also important measures.

**Wetland Conservation Fund:**

For securing NGO activities, sub-contract budget to NGOs should be clearly mentioned in respective conservation plans. To provide seed money to grass-root activities of NGOs that are not covered by the above projects, establishment of Wetland Conservation Fund is proposed. The major funding sources are State government and business sectors. Proposals and the result of selection are made open. Wetland Committee gives scientific advice on the distribution of the fund.