

CHAPTER 9

**WETLAND ECOSYSTEM
CONSERVATION PLAN
COMPONENT (5)**

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9.1 Basic Policy

Lowland of the study area is characterized by the extensive wetland areas that can not be seen in other populated area of Brazil. These wetlands are mainly located in agricultural areas and therefore many of them were already lost, converted and degraded. Nevertheless, still remains natural wetland areas. Although those wetlands play unique part of ecosystem diversity of Brazil, the functions and significance of wetlands are currently not sufficiently understood. People's attention to wetlands is area in a low stage. There are neither organizations nor policies focusing on wetlands. While people are indifferent wetlands, however, they are steadily degraded and encroached. Given this background, conservation measures are urgently needed with emphasis on raising awareness on wetland values and ecological functions.

Firstly it is necessary to give resident people opportunities to know wetlands and ecosystems so that they can regard them as the pride and assets of this area. The second is to promote wise use of wetlands compatible with ecosystem conservation, because wetlands of this area are mostly used for agricultural purposes. It is necessary to formulate site-specific conservation plans for some selected wetlands, and then extend such plans to other wetlands. Preparation of institutional mechanisms that can formulate and implement such policies is also necessary. Promotion of scientific research as well as collection and dissemination of information relevant to ecosystems is a basis for such scientific administration. Those measures should not be implemented without understanding and cooperation of resident people. For participatory conservation, cooperation of local NGOs is particularly necessary.

Under the limited financial and manpower resources, these projects should be promoted step by step. For wetland awareness, the 1st step is to target at core sectors such as government officials, school teachers, NOGs and leaders of relevant sectors. The 2nd step is to extend the target at large such as school children. Field conservation projects should also be started from priority areas, and then expanded to the overall wetlands, Not only protecting existing nature, restoration of already disappeared ecosystems should be focused as a long-term conservation targets.

9.1.1 Contents of the Plan

In line with the basic policy, five projects are proposed in the Wetland Ecosystem Conservation Plan. Characters and budgetary scale of each projects are shown in **Table 9.1-1**.

Table 9.1-1 Projects Character (a) and Costs (b) in Wetland Ecosystem Conservation Plan

(a) Projects Character

Project	Awareness measures	Regulatory measures	Field conservation measures
1. Wetland awareness and capacity building project			
2. Camaqua riparian forest conservation project			
3. Del Rei wetland conservation project			
4. Restinga rehabilitation project			
5. Wise use promotion project			

(b) Projets Costs

Project	Initial costs (US\$)	Operation and Maintenance cost* (US\$)
1. Wetland awareness and capacity building project	1,350,000	329,000
2. Camaqua riparian forest conservation project	6,815,000	152,000
3. Del Rei wetland conservation project	2,779,000	136,000
4. Restinga rehabilitation project	1,484,000	131,000
5. Wise use promotion project	834,000	61,000

*: Operation and Maintenance costs are annual averages during 2001 - 2020.

They include following contents:

- 1) Strengthen environmental awareness for school children and communities. This includes facility plans such as improvement of access and observation facilities. “Floating School Project” in Shiga Prefecture (population 1.2 million) of Japan, that provide lake visiting experiences to 12,000 school children annually, is referred as a mass environmental education system.
- 2) Improve the ability of administrative authorities to clearly explain the importance of

wetlands and their conservation.

- 3) Propose institutional, legislative and funding mechanisms including establishment of a wetland committee.
- 4) Propose measures for the wise use of wetlands. Utilization of varied wetland functions are explored. Water quality purifying functions for sewage treatment is among them.
- 5) Propose a framework for the guideline for wetland use and conservation including registration to the Ramsar Convention. Establishment of conservation standard, zoning and land use regulations, legislative and institutional mechanisms are among them.
- 6) Propose a conservation plan for important wetlands at Camaqua riparian forest and Del Rei wetland. Restinga rehabilitation project and Wise use Promotion project are also related to conservation of wetlands at Canal de Sao Goncalo and Lagoa Pequena, respectively. Measures to maintain wetland water level are among important conservation measures. These are formulated in conjunction with other basin conservation plans and existing eco-tourism and park management plans.
- 7) Propose an information collection and publication system for wetland and ecosystem monitoring. This includes cataloguing of fauna and flora as well as socio-economic information by using wetland information sheet.

Those projects are implemented by different agencies in SEMA. Mar-de-Dentro Secretariat plays a role of coordinating agency of those projects. A Wetland Committee is newly established.

9.1.2 Selection of Priority Wetlands for Conservation

Judging from ecological importance, socio-economic uses and danger of environmental degradation, priority wetland areas for conservation were selected as shown in **Table 9.1-2**. Camaqua riparian forest and Del Rei wetland are among priority areas for conservation. Camaqua riparian forest is the largest remaining forest in the lowland, and it is a type of wetland as the forest is seasonally flooded. The area supports many bird and plant species. Although the downstream has long been gazetted as Camaqua State Park, management plan has not been formulated. In combination with upstream areas,

conservation project is urgently needed. Del Rei wetland is the largest natural wetland of this area. That looks as it did in old days. Combined with its importance as bird habitat, conservation value of Del Rei is very high. Compared to the above areas, conservation values of Lagoa Pequena and Canal de Sao Goncalo may not be higher, but priority should be given also to these areas because they are threatened by intensive human use.

Estuarine part of Patos Lake is also an important habitat for aquatic organisms. Although it is a threatened ecosystem, the site is not dealt in this project because: 1) aquatic fauna of the area is mainly that of sea and brackish water, 2) it should be conserved as coastal management rather than lake management issue, 3) establishing restricted areas is not appropriate conservation method in this urbanized and industrialized areas and 4) environmental awareness of various sectors at large should be major conservation line at this area. Lagoa do Peixe National Park is a priority area for conservation judging from its ecological importance and environmental vulnerability. As IBAMA already has a conservation plan of this area as a national park, L. Peixe is not dealt in this master plan. Taim is also the similar situation although it is already protected and environmentally stabilized under the management of IBAMA. Other coastal areas are also important for migratory birds and marine mammals, but needs for conservation project will be lower because of low development pressure.

Table 9.1-2 Priority of Wetland Conservation Needs in the Study Area

No.	Sub-basin	Wetland Areas	Current status			
			Ecological importance	Socio-economic uses	Danger of degradation	Need for conservation measures
1	L30-3	Rio Camaquã riverside	○		○	
2	L30-4	Parque Estadual do Camaquã	⊙	○	⊙	⊙
3	L30-5	Agricultural reservoirs near Arambaré		○		
4	L30-5	Wetland system near Lagoa do Cerro				
5	L30-5	Lagoa Formosa (near Tapes)				
6	L30-5	Arroio Velhaco	○			
7	L30-6	Banhado do Caipira			○	
8	L30-6	Arroio Grande in L30-6	○			
9	L40-8	Lagoa Pequena	○	⊙	⊙	⊙
10	L20	Parque Estadual de Itapuã	⊙	○		●
11	L20	Lagoa dos Barros				
12	L20	Lagoa Capivary		○		
13	L20	Lagoa dos Gateados		○		
14	L20	Banhado Grande in L20	-	-	-	-
15	L20	Banhado das Casimbas	-	-	-	-
16	L20	Lagoa da Reserva		○		
17	L20	Lagoa do Rincão		○		
18	L20	Lagoa do Sumidouro		○		
19	L20	Banhado Claudinho		○		
20	L20	Coastal lakes north of Peixe National Park				
21	L20	Lagoa do Peixe National Park	⊙	⊙	⊙	●
22	L20	Coast between Peixe N.P. and Rio Grande	○			
23	L40-2	Lagoa da Turnera				
24	L20	Lagoa dos Patos eastern (L20) side		○		
25	L30-5,6	Lagoa dos Patos western (L30-5,L30-6) side		○		
26	L40-2	Lagoa dos Patos estuarine (L40-2) part	⊙	⊙	⊙	⊙
27	L40-2	Ilha da Torotama		○	○	
28	L40-2	Saco do Mangueira		⊙	⊙	
29	L40-1	Del Rei wetland system	⊙	○	○	⊙
30	L40-1	Banhado dos Afogados		○	○	
31	L40-1	Rice paddy I near BR-471	○	○	○	○
32	L40-1	Banhado de São Miguel	○			
33	L40-1,2	Barra Falsa wetland system		○	○	
34	L40-3	Lagoa Mangueira	○	○	○	
35	L40-2,3	Banhados between Taim and Quinta	○			
36	L40-3	Estação Ecológica do Taim	⊙		○	●
37	L40-3	Arroio Pastoreio	○			
38	L40-3	Coast between Rio Grande and Chui	○			
39	L40-5	Arroio Juncal		○	○	
40	L40-4	Rio Jaguarao	○			
41	L40-5	Banhado Mundo Novo	○	○		
42	L40-5	Banhado Mato Grande	○	○		
43	L40-1,5,6,7	Canal de São Gonçalo and Lagoa Formosa	○	⊙	⊙	⊙
44	L40-6	Rio Piratini	⊙	○	○	○
45	L40-7	Arroio Pelotas	○	○	○	
46	L40-5	Lagoa Mirim western (L40-5) side		○		
47	L40-1	Lagoa Mirim north-eastern (L40-1) side	○			
48	L40-1	Lagoa Mirim south-eastern (L40-1) side		○		

Notes: ⊙, High; ○, applicable; ●, Conservation plan already exists; -, No information.

9.1.3 Relevance with the Ramsar Convention

As Brazil is a member country of the Ramsar Convention, the Ramsar Strategic Plan 1997-2002 should be esteemed for wetland conservation of this area. Out of eight major objectives of the Strategic Plan, six items are applicable to this area and they are dealt as follows:

Objective 2 (Formulate wise use guidelines): This is achieved through Wetland awareness and capacity building project and Wise use promotion project.

Objective 3 (Raise awareness on wetland values and functions at all levels): This is achieved mainly through wetland awareness and capacity building project.

Objective 4 (Promote capacity building of officers relevant to conservation and wise use of wetlands): This is achieved mainly through wetland awareness and capacity building project.

Objective 5 (Secure conservation of registered wetland): Although Lagoa do Peixe National Park is already a registered Ramsar site, its management is not dealt in this plan because there already exists a conservation plan under the management of IBAMA.

Objective 6 (Register appropriate wetlands with emphasis on those in trans-boundary areas and lowly represented types): Del Rei wetland is proposed as a new Ramsar site. It is an area near Uruguay border and retains typical landscape as wetlands of this area had in the past. Del Rei wetland, Taim Ecological Station and surrounding areas collectively meet the Ramsar Criterion 6 that is a 1% criterion for waterbird populations. Ecosystem of the above area is related to that of Banhados d’Leste, a Ramsar site in Uruguay.

Objective 7 (Promote international cooperation): To promote international exchange, convening of international conferences is proposed in the wetland awareness and capacity building project.

9.2 Awareness and Capacity Building for Wetlands and Ecosystems

This project aims at providing following opportunities to various sectors:

- Field visit,
- Training,
- International exchange

Promoting awareness should be started at an earlier stage of the wetland and ecosystem conservation plan, because other field projects cannot be successful without understanding and cooperation of relevant people from resident people to top decision makers. In this project, following points are emphasized.

- 1) Indifference of people to wetlands is largely due to the situation that they have not seen and experienced. Therefore, this project emphasizes experiences in the field rather than classroom lectures.
- 2) This should be an active project. In conventional approaches, awareness materials are made just only to wait that they are used. Visitors to field facilities are not scheduled and their numbers fluctuate by seasons. Their knowledge level is also variable. To make full use of limited financial resources and human power, this project emphasizes scheduled and organized visits under the guidance of experienced interpreters. This also leads to minimizing negative impacts on ecosystems such as birds.
- 3) This project aims at participation of as many people as possible with emphasis on school children. This leads to cost effectiveness of the project. More important is that resident families can have opportunity of field visit regardless of their income status.
- 4) In this program, not only natural ecosystems but also socio-economic aspects of wetlands are taught so that they are wisely used.

Although emphasis is laid on the above directions, other awareness measures should also be combined as appropriate. These include campaigns (exhibition, demonstration, community functions), personal channels (lobbying, advisory actions to decision makers and community leaders), materials (leaflets, cartoons, newsletter, videos), web sites, mass media (TV programs, newspaper articles, press release) and seminars to specific

sectors (e.g. a seminar of Private Reserves of Natural Patrimony (RPPN) to land-owners).

9.2.1 Field Visit

The followings are project components by target groups.

(1) Target

The major target of field visit program is school children of 5th grade (around 10 years old) in Mar-de-Dentro area. By continuing this program, by the year 2020, it is expected that all the families in Mar-de-Dentro area will have at least one family member who has experienced wetlands in the field. This results in gaining the support of the residents for conservation. Those who are not school children are dealt as community groups. The total number of field visit participants will be approximately 15,000 annually.

School teachers, diet members, officers and decision-makers of State government and municipalities, NGO staff, community leaders, representatives of business associations and media people should be given prior opportunities at an earlier stage of the project. This is because this program cannot be successful without thier understandings and support. Annual participation of 1,000 core group members are expected and by 2010 total 10,000 of them will have field visit experiences.

Although the major target of this project is resident of Mar-de-Dentro area, arrangement is necessary so that resident of Porto Alegre and other parts of Rio Grande do Sul State con participate in it through exchange program.

(2) Major activities

A group participants (30-60) experience 2 or 3 day's bus trip to wetlands under the guidance of experienced interpreters. Cooperation of NGOs as instructors and leaders is necessary. About 300 trips are offered under an annual schedule (**Table 9.2-1**). In the lecture they learn wise use concept by using Info Packs prepared by the Ramsar Bureau and Wetland Information Sheet.

Table 9.2-1 Example of Bus and Boat Trip Schedule

Day 1			Day 2			Day 3		
AM	PM	Night	AM	PM	Night	AM	PM	Night
Pick up	Visit Field 1	Stay at Field 1	Lecture at Field 1	Move to Field 2	Stay at Field 2	Visit Field 2	Lecture at Field 2	Return home

Experience of field observation by boat may be given at Camaqua river, Del Rei wetland and Lagoa Pequena. Not only wetlands but also following places and facilities can be potential visiting places (**Fig. 9.2-1**). Those places can be combined flexibly according to the request of respective groups and seasonalities (**Table 9.2-2**).

Table 9.2-2 Potential Places to be Visited

	Places	Seasonality	Topics to learn
New facilities	Camaqua riparian forest	Avoid floating season	Riparian forest and river ecology
	Del Rei wetland	Avoid wet season	Wetland fauna and agriculture
	Sao Goncalo	All year round	Wetland flora rehabilitation
	Lagoa Pequena	All year round	Wise Use concept through fishery
Existing facilities/places	Itapuã State Park	All year round	Local flora
	Lami Biological Reserve	All year round	Local flora
	State Zoo	All year round	Endangered or extinct birds and mammals and their rehabilitation
	FURG Eco-Museum	All year round	Brackish ecosystems
	UFPEL Natural History Museum	All year round	Specimen of plants and animals
	UFPEL Permanent Preservation Forest	All year round	Forest ecology and protection
	Barra de Rio Grande	All year round	Marine mammals
	Lagoa do Peixe National Park	Migratory season	Migratory birds
Taim Ecological Station	All year round	Wetland ecology	

(3) Major facilities

Following facilities are necessary: a) field visit buses (6 large and 3 medium) with a bus

base at Camaqua, b) accommodation for 60 persons at Camaqua and Taim, c) boat trip and field observation facilities at Camaqua and Del Rei, d) visitor facilities at Camaqua, Del Rei, C. Sao Goncalo and L. Pequana (these are constructed under the conservation projects of respective places).

(4) Major institutional arrangements

Secretariat for preparing annual schedule and coordinating schools (non school children are dealt at community level), b) bus operation base and c) NGOs who can cooperate in the field visit.

9.2.2 Capacity Building

To promote decentralized conservation, capacity building of municipalities as well as state government is emphasized. State government and universities are expected as implementing agency of the following program. At the same time, however, possibilities should be sought to implement this as joint program with other States in Brazil or international cooperation program including Uruguay.

(1) Training for Wetland Ecosystems and their Biological Diversity

This project aims at strengthening capacity of government officials to following levels:

- To acquire basic information and techniques for investigation of natural resources, zoning of protected areas, conservation and management of protected areas.
- To acquire knowledge and techniques to implement guidelines of the Ramsar Convention.
- To be able to give one day lecture on above topics.

1) Target

Annually 20 mid-level officials of municipalities and State government including development sectors.

2) Course curricula

- Lecture

 - Nature protection administration in Brazil

 - International cooperation for waterfowl and wetland conservation

 - Protection and restoration of endangered species

 - Hydrology of wetlands

- Exercise

 - Vegetation mapping

 - Awareness activities for bird protection

 - Eco-tourism

 - Presentation of action plans

- Inspection

 - Site visits to places shown in **Fig. 9.2-1**

 - Typical wetlands

 - Research institutes in the State on agriculture, fishery and ecology.