Profile of social actors as a tool the definition of marine protected areas: the case of the Ilha dos Franceses, southern coast of Espírito Santo, Brazil

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ABSTRACT
In 2003, the area surrounding the Ilha dos Franceses was proposed for the establishment of a marine national park. Currently, the process is under a re-planning process by ICMbio. Structured interviews, based on specific questionnaires, have surveyed the profile of social actors involved with the island and the proposed areas. Small merchants and fishermen are highly influential in the local community. They support tourism though they point problems during the periods of higher tourist visitation. Tourists in the island and the Itaoca beach have a similar profile and stay in the houses of friends or relatives that live in the area. Island visitors are, in general, guided by local fishermen and are not well prepared for nature tourism. Some visitors complain about the services provided by the fishermen and the lack of management of activities. Many fishing activities are performed in the area and, some of them, according to the fishermen themselves, might be considered predatory. The proposal for the establishment of the PA is unknown by most; however, it is seen as positive by the majority of the interviewees because of the scenic and ecological preservation of the area. However, the same interviewees fear that visitation and fishing will be restricted. In this paper, we suggest categories and strategies for the implementation of the PA that best fit the socio-environmental realities of the area.

Keywords: stakeholders, marine protected area, coastal island, visitation.

INTRODUCTION
The state of Espírito Santo possesses important coastal ecosystems, and is characterized by a high heterogeneity of environments and landscapes, which provides it with a great biological diversity (Martins & Doxsey, 2006). Despite this peculiarity, the increase in population in the coastal area has caused a great pressure over coastal ecosystems, similarly to other places in the world (Sobhee, 2004). The main problems are related to random occupation, to the over-exploitation of natural resources, and to the use of destructive exploitation methods, which cause great environmental disturbances (Walmsley & White, 2003), the decline of natural resources stocks and the degradation of the quality of life of coastal communities.

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The best strategy of protection and management of ecosystems and their resources is the preservation of natural communities and populations in wild environments (Primack & Rodrigues, 2001), such as through the establishment of preservation areas (PAs). According to the Brazilian government’s National System of Preservation Areas (NSPA) (BRASIL, 2000), the categories that are viable to be implemented in a marine area are: of integral protection, such as national park (PARNA) and wildlife refuge (REVIS), or of sustainable use, such as environmental protection area (EPA), extractivist area (RESEX), and sustainable development reserve (SDR).

Over the last years, Espírito Santo has been the target of several proposals for the establishment of PAs that include marine areas, such as the proposal for the establishment of the Ilhas de Guarapari Marine State Park; the Santa Cruz Marine National Park; the Arquipélago Ilhas do Sul Capixaba Marine National Park; the Barra Nova Extractivist Area; and the Foz do Rio Doce Sustainable Development Reserve, surrounding the Comboio Biological Reserve; however, all suffer from red-tape obstacles and/or conflicts with big companies. Until now, only the proposal for the establishment of the Costa das Algas Environmental Protection Area and the Santa Cruz Wild Life Refuge, which replace the proposal for the establishment of the Santa Cruz Marine National Park, was submitted to public consultation by ICMbio, completing one of the main steps in the creation of PAs (R. Sforza, personal communication).

Natural marine protected areas are recognized as excellent tools for conservation and management of fishing activities, because they offer an effective protection for commercial species, maintaining the ecological integrity and function of habitats and ecosystems, and providing recruits and fishing stocks to the surrounding areas (Turner et al, 1999; García-Charton et al, 2000; Tupper & Rudd, 2002).

However, aiming at an adequate management each case must be well analyzed under a multi-disciplinary perspective, taking into account not only information about the area’s environmental relevance, but also the understanding of the relationships between the social actors who are involved and between the latter and the environment in which they live (Adams, 2000). Proposals for the establishment of PAs that do not take into consideration the characteristics of the users face difficulties during the implementation process, scheduling of activities, and management agreements (Kalikoski, 2007).

A local diagnosis might help understanding the community’s perception regarding the environment and the system where it lives, helping plan local development, conservation plans, and awareness. Environmental perception studies are considered excellent tools for environmental planning as they study the knowledge and the ethics of a certain community in relation to the environment (Takahashi, 2004). Different works on this subject have been developed in PAs in Brazil and their results have helped in the design and adaptation of management plans and the ordainment of public activities by the respective managers (Silva, 2007). However, it has been noticed that few research efforts are committed before the establishment of PAs or during the proposal process.

Due to little information available during the development of the proposal of the Arquipélago Ilhas do Sul Capixaba Marine National Park, located in the south coast of Espírito Santo, this study aims at presenting the profiles and the activities of the different social actors involved in the area where the Ilha dos Franceses is located, including the proposed area. The relationships, perceptions, and forms of dependency of distinct actors with the insular environment, which is an important tourist and fishing attraction in the state, were analyzed through interviews based on questionnaires. The chosen method for gathering information is the most frequent in researches in Human Sciences, and is characterized by the systematic and ordained
collection of information (Takahashi, 2004; Silva, 2007). From the results obtained, categories and implementation strategies of PAs are suggested that best fit the ecological and social realities of the area.

MATERIAL AND METHODS

Study area

The Ilha dos Franceses is located on the southern coast of the state of Espírito Santo, Brazil (20° 55’ S; 40° 45’ W), 4km off the Praia de Itaoca, town of Itapemirim (FIGURE 1). It is the largest island in the coast of Espírito Santo, measuring approximately 135,000 square meters, and is positioned parallel to the coastline. Its highest point is 36 meters above sea level, where a lighthouse was built in 1883, which is currently maintained by the Brazilian Navy.

The island’s edges are predominantly rocky, formed by steep and high walls, with a small beach made mainly of bioclastic sediments. The island’s vegetation is mosaic-like, related to the restinga formation typical of the Brazilian coastal ecosystems (Ferreira et al, 2007). The island is surrounded by cliffs and rocky reefs, limestone algae banks, and estuaries, being important habitats for several species of marine life.

The Ilha dos Franceses is under the responsibility of the Brazilian Navy, though its sole permanent sign of presence is a plaque on the trail that leads to the lighthouse that reads: “Landing is forbidden, area belonging to the Brazilian Navy.” It sporadically executes short-term military training at the location. Most of the time, including periods of greatest tourist activity in the municipality, the island is abandoned, without any infrastructure for law enforcement, support or tourist visitation.

All the island’s attractions are natural, with emphasis on the isolation in relation to the urbanized continent, and its clear waters, ideal for scuba diving in its reefs and swimming. The landing of visitors to the island is performed directly on the rocky cliffs, in the eddy area (west side), which allows the boats to get near. Visitors generally go the island’s sole beach, where they develop leisure activities such as sun- and sea-bathing, fishing, scuba diving, and spear-fishing. There is also constant visitation by artisan fishermen and shellfish collectors, all of whom live in Itaoca or in neighboring towns. Itaoca has around 50 fishermen and a fleet of 20 boats (Martins & Doxsey, 2006).

The proposed PA

The coast of the state of Espírito Santo is 400 kilometers long and has islands and oceanic
banks that are located up to 1,200 kilometers away from the continent; however, it does not have any PA that is exclusively marine. Only the Setiba EPA, located in Guarapari, has marine areas in one of its limits. In 2003, civilian institutions and entities, such as the Colônia de Pescadores, the Escola de Pesca de Piúma, the Centro Cultural, and the Projeto TAMAR-IBAMA, together with the city administrations of Piúma and Itapemirim, proposed to the ICMbio the establishment of a marine national park between the towns of Piúma and Itapemirim, southern coast of the state of Espírito Santo, along the coordinates 20º 50’44”S e 20º 59’00”S, which would put the Ilha dos Franceses under protection. One of the suggested names for this PA was Ilhas do Sul Capixaba National Marine Park. The boundaries proposed were established so that representative areas of different marine substrates and the coastal islands in the area were included, drawing a five-sided polygon, whose sides parallel to the coastal line follow approximately the 25-meter isobath (FIGURE 2). The proposed area for the PA encompasses an area of approximately 12,000 hectares and a perimeter of approximately 25 nautical miles, including a tract of territorial sea and

Figure 2: Nautical Chart 1402, indicating the proposed area for the establishment of the Ilhas do Sul Capixaba National Marine Park.
five islands that are distributed in the coastal area. Currently, the proposal is being reevaluated by the ICMbio and fast participative diagnoses are being organized by ICMbio and other institutions in order to put the finishing touches to a new proposal.

**Data collection and analysis**

Aiming at obtaining information about the actors involved with the Ilha dos Franceses, interviews were done based on specific questionnaires for each category of the social actors involved. The social actors were classified into: visitors to the Ilha dos Franceses (Questionnaire I); tourists on the Praia de Itaoca (Questionnaire II); village of Itaoca community (Questionnaire III), and fishermen (Questionnaire IV). 56, 67, 27, and 19 questionnaires were applied respectively, in a sum of 169 interviews. The interviews were done between January and March of 2004, with questionnaires I and IV being applied in the Ilha dos Franceses, and questionnaires II, III, and IV were applied in Itaoca. The questionnaires are held at the Associação Ambiental Voz da Natureza, under the responsibility of the first author of this paper.

The activities of the different actors in relation to the land and marine environment of the study area, and the use of the space by visitors and fishermen, were registered during the interviews and in monthly visitations performed earlier (from September 2002 to April 2004). It was not disclosed to the interviewees that the PA category proposed for the location would be a national park (integral protection), because the proposal is under review by the ICMbio.

We performed chi-square tests in order to verify significant differences between answers to questions that could only obtain two replies, such as “yes or no” and “agrees or disagrees.” For the chi-square test, questionnaires without answers were not taken into consideration, the same happening to answers that were not related to the question. The calculation of the confidence interval (95%) of the proportions was performed according to Zar (1999).

**RESULTS**

**Visitors to the Ilha dos Franceses**

The Ilha dos Franceses, like the other coastal islands in Espírito Santo, does not present any management nor infrastructure for visitation. Despite this, it receives visitors during the entire year, especially during summer. Visitors are characterized as family groups (44.6%) or group of friends (42.9%), mainly young males (78.6%, $\chi^2$ test, p<0.001). Most of the visitors are from other states, mainly Minas Gerais (51.8% of the visitors).

The tourists who were interviewed at the Ilha dos Franceses usually were staying in the village of Itaoca, where they rented a house (46.4%), or owned a house (23.2%), staying in the area between 7 to 15 days (50%). Almost half of the visitors interviewed had already visited the island during previous years. They use to get to the island through fishing boats and schooners that operate in the area, and in their majority, they stayed in the island for a few hours (88.3% of the visitors stay up to 5 hours in the island). Visitors that are native from the region usually arrive on their own boats, ferrying large groups of people and remain in the island longer. The landing of the latter is done through small boats, and the main boat usually is moored over the reefs in front of the small beach.

Among the most common activities developed by the visitors to the Ilha dos Franceses are sports such as diving and spear-fishing, and trekking on the island, and leisure activities such as barbecues, sun- and sea-bathing. These practices, because of the number of visitors and the lack of management, cause a strong aggression to the natural aspects of the island. As a consequence, there is an accumulation of litter, opening of clearings and trails in the vegetation, depredation of the light-
house, and degradation of the marine fauna, caused mainly by the collection of marine invertebrates and fish, as well as the stomping of corals and other benthonic organisms.

The island presents some environmental characteristics that are hostile to visitors such as trails on cliffs covered by cactuses, lack of shade and of sources of fresh water, offering risks to unprepared visitors. The majority of tourists stated that they did not receive any information from the fishermen and masters of boats about the characteristics of the island, which are basic requirements (source of shade and fresh water) or the conduct to be followed during the visitation (64.3%, $\chi^2$ test, p=0.009). Some had heard stories and legends about the island, few of them had received information about the veto to visitations to the lighthouse by the Brazilian Navy, or advice on what to do with litter, or how careful they should be regarding the cliffs and thorns (both by sea-urchins and local vegetation). Many tourists feel disoriented, unprepared, and un-motivated due to the lack of information and to the fact that the boats just leave them on the island, when they return to the continent in order to perform other trips to ferry more visitors. The data reflects a picture of unprepared and uncontrolled visitation.

Lack of infrastructure was mentioned by some tourists as negative points of their visit to the island, such as lack of commerce (a bar – 17.9%), lack of fresh water and shade (14.2%), besides the inexistence of an adequate management for the area (16.1%), which contributed for the low satisfaction by the interviewees. Only 28.6% of the interviewees were satisfied with the visitation and enchanted with the natural beauty of the island.

When they were asked how to preserve the island, the great majority of the visitors stated that people could help by not leaving litter behind (73.2%). The depredation of the place was almost not mentioned (8.9%). The answers contradict the actions of many visitors. Some of the interviewed (12.5%), bearing in mind the impacts that occur in the island, were favorable to programs of environmental awareness.

Despite all the actions against the island’s integrity, the interviewees support its preservation, agreeing with the idea of the establishment of a PA in the location (96.4% $\chi^2$ test, p<0.001). They made positive remarks regarding the establishment of the PA (48.2% of the interviewed), in case there is an adequate management, with information center, first-aid in case of accidents, and preservation of the scenic and natural beauty of the place. Some visitors were concerned in relation to possible restrictions to visitation and fishing (21.4%).

**Tourists at the Praia de Itaoca**

The tourists sampled at the Itaoca beach had some characteristics in common with the interviewees at the Ilha dos Franceses. They were mainly from the state of Minas Gerais (70.1%), as well as from other cities in Espírito Santo (25.4%), they rented summer houses (52.2%), and were predominantly in family groups (77.2%), staying between 7 and 15 days in the area (64.2%). Despite the village of Itaoca having areas for camping, B&B’s, and hotels, only a small part of the tourists use these types of lodging (4.5%).

In spite of the fact that it is located only 4 kilometers away from the Itaoca beach, from where it is easily seen, many tourists did not know or had never heard about the Ilha dos Franceses (43.3% $\chi^2$ test, p=0.271). Of those who had already visited it (29.9%), mainly in years prior to the interview, the majority enjoyed the experience (84.2%, $\chi^2$ test, p=0.007) and stated they returned to the location every year. These tourists showed the same infrastructure demands, such as the need for some kind of commerce in the island.

The great majority agrees with the establishment of a PA in the island (79.1%, $\chi^2$ test, p<0.001), adding that it could bring socio-economic improvements to the region and an
adequate management for the area. Some were worried that restrictions could be imposed on visitations to the island (23.9%). The majority did not have an opinion about the possible establishment of the PA (55.2%) and few pointed out that the best for the island is to keep it as it is (9.0%).

Village of Itaoca community

The sampled community is made up mainly by immigrants from other towns in Espírito Santo (48.1%) and from other four states, who have been living in the area for over five years (77.8%). People born in the city of Itapemirim make up 33.3% of the interviewees.

When they were asked about tourism in the area, the majority had a dismal opinion, saying it is weak and/or is getting worse (51.9%), classifying tourists as “tourists with little money.” The optimistic ones (40.7%) thought that tourism is good and/or is getting better and brings increased income. The businessmen in Itaoca complain about the low quality of the tourists, who arrive to the area with little money, bringing food from their place of origin, spending little money in local commerce. About what could be done in order to improve tourism in the area, 51.9% of the interviewees pointed out investments by the City Hall in infrastructure (sidewalks, kiosks, sanitation works, public safety), which might contribute and influence tourists with better financial conditions and in larger number to visit the area.

Of the interviewees, a great majority had already visited the Ilha dos Franceses several times (70.4%, $c^2$ test, p=0.018), seldom staying in the island for more than a day. They pointed out the natural beauty, fishing and diving as the main attractions. The inhabitants of Itaoca have strong ties with the Ilha dos Franceses, and enjoy it and use it for leisure and recreational activities.

We noticed that a portion of the interviewed community (non-quantified data) had difficulties in defining the island’s state of conservation, but some of them (37.0%) talked about its scenic beauty, its flora and fauna, and identified the negative impacts, mentioning the matter of litter left behind in the island. Other interviewees attribute to the authorities the responsibility of preserving the island, pointing out the inexistence of management and overseeing (14.8%).

The majority of the interviewees agree with the idea of the establishment of a PA in the island (59.3%, $c^2$ test, p=0.033), pointing out benefits such as the improvement of the infrastructure in the village of Itaoca, the appreciation for fishing, the increase in boat trips and tourism in general (51.9%). According to the members of the community interviewed, the PA would be detrimental only if fishing and/or visitation were to be forbidden. Those who disagree think mainly in the malefic effects of a possible restriction of their usual activities, which many have been practicing since an early age, such as leisure and fishing (7.4%). Many did not have an opinion about the consequences of the possible establishment of the PA (40.7%).

Fishermen from the village of Itaoca

The fishermen that were interviewed were, in their majority, born in Itaoca and in the city (42.1% and 21.1% respectively), and were over 40 years old (78.8%). The majority had already been fishing in the area with their fathers (non-quantified data) and did not have education opportunities, consequently, they possess low (basic education; 52.6%) or no schooling (42.1%).

Local fishermen practice several types of artisanal fishing, such as line fishing, currico (fishing with artificial bait), beach seine fishing from the beach and on the island, otter-trawl net, gillnet and deep sea fishing. Line fishing is practiced in the coastal area, from the Itaoca coast line to a few hours out of the Ilha dos Franceses. The currico is performed around the reefs and cliffs of the island. Beach seine fishing aims at great schools of fish, and
it is executed in the beach of Itaoca and in the sheltered zone in the Ilha dos Franceses, demanding a large number of fishermen to be performed. Otter-trawl fishing is performed in the southern and northeastern areas of the island. Gillnet fishing is performed, generally, a few meters from the cliffs and reefs. Deep sea fishing is performed mainly by younger fishermen who go out to sea in semi-industrial boats (14-meter boats) to fish in deeper waters (surface or bottom long-lines).

Half the fishermen alternate fishing arts (52.6%), having more than one alternative in case one of them fails or during prohibition periods, such as the period of reproduction of shrimp. Few fishermen use leisure trips to the island as an alternate source of income (21.1%, \( \chi^2 \) test, \( p=0.011 \), landing tourists or simply circumnavigating the island.

A great portion of the fishermen also use to go to the island for leisure and fishing (84.2%, \( \chi^2 \) test, \( p=0.005 \)), often with their relatives and friends. They use to moor their boats over the reefs, on the surrounding areas of the island, and land right on the small beach with the help of canoes. They also use to clean the hulls of the boats (scraping off natural incrustations or paint) in the shallow waters of the sheltered zone.

We have noticed that the fishermen, like the community, had difficulty understanding the concept of “conservation” when they were asked about the state of conservation of the island. When they compared the current state of the island with its state in the past, the fishermen said that fish was more abundant in previous years, with plenty of sharks and other large predators such as groupers and jacks. They tell stories about when their fathers need to dragnet fish only once a week, and were not able to salt all the fish. However, 42.1% think that the island is still well preserved.

In regards to the diminishing stocks of fish, the fishermen blame predatory practices such as trawling (31.6%), excessive fishing (increase of effort) (26.3%), fishing during reproduction (15.8%), and lack of control during reproduction periods (5.3%). Some of the interviewees did not know what to answer (10.5%), while others think that the fish did not decrease in numbers, that it has disappeared due to natural phenomena (5.3%). It is common for fishermen to point out a competing fishing activity as the cause for the decreasing of fish. Many speak openly about the necessity to fish during the prohibited periods, or to use exploitative techniques in order to provide for their families and relate this situation to the lack of support from the government for these economic activities (non-quantified data).

When they were asked whether anything harms the island, the fishermen also related the question to situations that are prejudicial to them. They mentioned predatory fishing (15.8%), littering (5.3%), depredation of the lighthouse (15.8%), and the several other boats that visit the island (36.9%), the latter being held responsible for scaring off the fish and discharge oil at sea. Some fishermen did not what to answer (26.4%).

Fishermen pointed out that the main forms of improvement and maintenance of the island’s integrity would be control (31.6%) and the prohibition of fishing with gillnets. Some fishermen were not able to answer (26.3%). Many of them perform activities, such as the use of certain equipment and fishing during prohibition periods, that they recognize are harmful to the environment and, consequently, to fishing.

The majority (84.2%, \( \chi^2 \) test, \( p=0.004 \)) has never heard about the establishment of a PA in the area, but they agree with its implementation (94.7%, \( \chi^2 \) test \( p<0.001 \), adding that it would benefit the community (89.5% of all the interviewees, \( \chi^2 \) test, \( p<0.001 \)) by increasing tourism and income, adding value to the fish, guarantee the reproduction and growth of the fish, and improve the local infrastructure. However, 73.7% of the fishermen interviewed (\( \chi^2 \) test, \( p=0.038 \)) are worried about...
prohibition of visitation and fishing, since these activities are directly related. The fishermen are aware of the importance of protecting the island, but they are afraid because they keep a close relationship with the area and depend on it.

**TABLE 1** presents some characteristics and opinions of distinct social actors that were interviewed.

### DISCUSSION

The integration of biodiversity conservation and sustainable use of natural resources, in practice, is extremely difficult, since the different uses of an area compete for the same resources. In Brazil, both recreational activities and fishing have an enormous social and economic importance, however, they are widely out of sync (Takahashi, 2004; Isaac et al, 2006). In the meantime, several coastal islands, which are fragile environments due to isolation, have, over the years, been suffering heavy degradation in their ecosystems, especially because they are located near urbanized areas (Badalamenti et al, 2000) and are periodically visited by fishermen and tourists (Tershy et al, 1997). Activities that are considered leisure by visitors might represent a threat to the integrity of these islands. Some authors refer to certain cases as “tragedy of the commons”: when the rights of propriety and rights to resources are ill defined, and they are not attributed a monetary value, people exploit, use, and damage these resources, resulting in significant environmental degradation (Primack & Rodrigues, 2001; Sobhee, 2004).

Visitors to the island, as it has been observed in this study, are not instructed on behavior codes or even receive basic guidance for nature tourism, like taking fresh water, sunscreen, garbage bags, and so forth. According to Takahashi (2004), most of the problems of recreational use occur mainly due to bad behavior by the visitors. Sabino & Andrade (2003) state that tourist activity, when ill-conducted; can negatively affect the sensible components of the environment. As it has been observed in some marine and terrestrial preservation areas (PA) (Plathong et al, 2000; Zaidan, 2002), excessive use of leisure resources has brought about a situation of accelerated degradation process, especially near trails that link the most frequented places, generating direct changes in local diversity.

**Table 1: Characteristics and opinions of distinct social actors that were interviewed in the Ilha dos Franceses and in Itaoca between the months of January and March of 2004 (%=percentage; IL= inferior limit of the trust interval of the %; SL=superior limit of the trust interval of the %).**

<table>
<thead>
<tr>
<th>Characteristics/Opinions</th>
<th>Island visitors</th>
<th>Tourists in Itaoca</th>
<th>Itaoca Community</th>
<th>Itaoca Fishermen</th>
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<td>Others states</td>
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</tr>
<tr>
<td>Have already visited the Ilha dos Franceses</td>
<td>44,6</td>
<td>31,3</td>
<td>58,5</td>
<td>29,8</td>
</tr>
<tr>
<td>Agree with the establishment of a PA in the area</td>
<td>96,4*</td>
<td>87,7</td>
<td>99,6</td>
<td>79,1*</td>
</tr>
<tr>
<td>Worry about possible restrictions</td>
<td>30,8</td>
<td>17</td>
<td>47,6</td>
<td>25,4</td>
</tr>
</tbody>
</table>

*p<0.05, Chi-square test
A great number of fishing activities usually take place in the area included in the proposal for the establishment of a PA (national park), which are performed, in the majority of the cases, by local fishermen that started their trade when they were adolescents, preferring that to a formal education. Thus, fishing activity is a significant socio-cultural and economic component for the local community. However, despite their artisan culture, some types of fishing can be predatory, having direct and indirect effects on coastal ecosystems (Turner et al., 1999), and require further studies regarding their significance and environmental impact (as is the case of shrimp trawling, seine fishing and gillnets developed in the area). One example of these impacts is the constant occurrence of deaths of juvenile green sea turtles (*Chelonia mydas*) in the sheltered area of the island, and the record of a dead grey dolphin (*Sotalia guianensis*) with wounds probably caused by gillnets. Local fishermen are aware of the possible causes of the over-exploitation of resources, for their concerns about predatory activities and opinions about the decrease of fish are similar to those of many scientists (Walmsley & White, 2003; McClanahan & Mangi, 2004).

The main tools for the management of areas that present multiple-use situations are regulation and zoning plans, created on technical-scientific basis and input from a broad participation of local communities. The community has a fundamental role in preservation, because the majority of the people have a strong relationship with the environment, and they are also responsible for its scenic and biological integrity. Yet, this group of social actors might resent possible restrictions to their activities, loss of physical space, and the sense of tranquility that they usually possess, as stated by Badalamenti et al. (2000).

Masberg & Morales (1999) emphasize that sustainable tourism involves greater community participation in the management and planning of local tourism. Also, the reach of this sustainability implies that studies are done about the support capacity in regard to the ecological, physical and social aspects, in order to sustain the balance of their direct relationship with the environment, thus warranting the survival of natural and cultural sources (Tristão, 2004). The trips to the island made by fishermen during periods of greatest tourist visitation represent an activity in which traditional knowledge is applied to a new way of using the area without the loss, for instance, of knowledge about the best landing spots, natural attractions, fishing, diving and bathing spots. This activity represents a way of sustainable subsistence of this environment. In several regions in the world, conservation institutions have encouraged the employment of local knowledge and labor both to conduct and guide tourists to the different attractions (Masberg & Morales, 1999; Takahashi, 2004) and for the establishment of new conservation areas and their management (Marcovaldi & Marcovaldi, 1999). What is missing, then, is a capacitation of fishermen in Itaoca who ferry visitors so that they are prepared to pass on to the tourists their experiences and knowledge about the natural areas and their culture.

Since the putting into effect of a management plan that aims at conservationism is made of the balance between the resident community, the environment, and the creators of PAs (Vieitas et al., 1999; Salomon et al., 2001), the prohibition of fishing, once Itaoca is a fishing community, or of any other activity, must be based and cautiously approached, so that measures are possible to implement.

The proposal for the establishment of a PA in the Ilha dos Franceses is unknown by the majority of the social actors involved in the area. The lack of commitment by the local population raises relevant theoretical and practical problems in relation to the efficiency of the protected areas (Diegues & Nogara, 1999). Several projects and programs establishing protected areas do not take into account in their decisions the opinions of local communities about such projects, with a sole dominance of the perception of institutional decision makers about the problem. Protected a-
reas established and imposed “from the top of the chain” can become a tool for the marginalization and erosion of the way of life of many communities (Kalikoski, 2007).

In fact, marine protected areas are able in providing efficient ecological conditions for the recovery of exploited species, increasing the populations and captures in adjacent areas (Turner et al., 1999; Tupper & Rudd, 2002; Walmsley & White, 2003), and the economic gains from their establishment are easily exploited by local communities (Badalamenti et al., 2000). However, the success of the management will always depend on the cooperation by the users of the resource (Walmsley & White, 2003). It has been increasingly recognized that without the awareness and involvement of local population, there is no way of guaranteeing the respect for the principles of socio-environmental and economic sustainability (Tristão, 2004).

The idea of the establishment of a PA in the Ilha dos Franceses, when presented, is received with optimism accompanied by some fear regarding the restrictions that might be imposed. The advantage seen by the population is that it allows the preservation of the island, bringing some management to the visitations (preventing accumulation of garbage and depredation), control, and generation of income through the improvement of tourism. Fishermen also point out as a positive aspect the recovery of marine fauna. However, the interviewees are concerned with a possible prohibition of visitation and fishing. In fact, the policy of limiting or excluding types of use is one of the most aggressive actions that an official can adopt (Takahashi, 2004). The surrounding community and the fishermen are more directly affected when a high degree of protection is established and some activities are prohibited, because they cause a decrease in fishing areas and resentment (Baladamenti et al., 2000).

Suggestions for the future proposal

The proposed marine national park, according to BRASIL (2000), aims at integral preservation of natural areas of great relevance in ecological aspects, natural beauty, scientific, cultural, educational, and recreational characteristics, vetoing environmental changes and direct human interference. This type of protected area would protect all the ecosystems contained in the area and would benefit the local community on the mid and on the long term, for, besides the preservation of its scenic beauty, its fauna and its flora would attract tourists and nature watchers, in an organized manner, bringing income to the village.

However, the proposed area includes fishing spots common to some fishermen. They would have to seek other areas in order to continue their activities. Fishermen, particularly, present a direct relationship of subsistence with the region, and their trade is extremely determinant in regional economy and culture. Even when it is predatory, fishing activity is intrinsic in local culture and development, and its prohibition and organization would have to be cautiously adopted, with a parallel program of support and activity restructuring.

This study presents suggestions regarding the best PA category to be implemented in the area. The definition of marine extractivist reserves by the NSPA (BRASIL, 2000) states that it is made of territorial spaces destined to self-sustainable use and conservation of renewable natural resources by traditional populations. It is also in sustainable development reserves that it is possible to materialize sustainable development, balancing ecological interests of environmental preservation with social interests for the improvement of the living of the populations that live there.

Based on different research both done (Ferreira et al., 2007) and ongoing in the area, we suggest the establishment of an integral protection PA in the mould of a PARNA or REVIS for terrestrial and marine ecosystems surrounding the islands (at a radius of approximately 1,000 meters), that are peculiar environments, with rich diversity and ecolo-
gical importance. However, we emphasize the importance of fishing activities for the area, which would be best served through the designation of an area for sustainable use, in the EPA, RESEX or SDR mould, which would surround the integral protection area, as it is the case in other marine protected areas in Brazil (Corumbau RESEX – HT Pinheiro & RP Molina, personal observation; Arraial do Cabo RESEX – Silva, 2007) and around the world (Badalamenti et al., 2000; Garcia-Charton et al., 2000; Walmsley & White, 2003).

This mosaic of manners of use and management of the area would comply to the necessities of preservation and recovery of resources, protecting the fragile and threatened vegetation of the islands, slowing down the current exploitation and destruction of ecosystems of reefs and cliffs, as well as of gravel and limestone algae bottoms, and interfering in a less negative manner on the activities currently being developed by the local community in Itaoca. The management of this area is seen as a great alternative for the recovery of fishing stocks and management of tourist activities. It is necessary to narrow the relationships between the creators of the project and the local population, aiming at making the process clear and showing the best ways of their involvement in the planning and administration stages of the PA, thus adding the peculiar aspects each environment possesses.

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