BIODIVERSITY, COMMONS DILEMMAS AND LOCAL CONFLICTS IN NATURAL PROTECTED AREAS

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1 Biodiversity, societies and sustainability

Environmental changes and related problems have gained a progressive relevance for scientific inquiry, for decision makers, and for the general public since the last decades. Within this context, ecological science have gradually shifted its general orientation from strict naturalistic and biological approaches to more social science-based paradigms, involving both natural and human (social and behavioural) sciences, like economics, sociology anthropology and social psychology (Bonnes, 1998; di Castri, Baker & Hadley, 1984; di Castri, 2000). This increased attention for the so-called "human dimension" of environmental global change has been defined as a Ptolemaic Revolution for the natural sciences (Bonnes, 1998; Giacomini, 1983). Together with such a more interdependent or "integrated" vision of biophysical and human (social, cultural, economic, and psychological) processes, there has also been a growing awareness that most of the environmental problems which affect the quality of our lives at a "local" level also have a "global dimension". Thus, there has been a widespread agreement about the need to articulate global and local concerns when facing environmental problems (Zube, 1991). That is, resolving "global" problems without starting from their "local" dimension is believed to be impossible. This need for articulation is clearly summed up in the well-known slogan "think globally, act locally". The shift in ecological science from approaches focused on the natural (i.e. the biological and physical) aspects of local/global ecosystems to approaches which emphasise the importance of human, societal and locally-relevant aspects was described by some authors as a moving from a "partial ecology" through a "full ecology" perspective (Bonnes & Bonaiuto, 2001; di Castri, 2000). Two concepts may be identified which are, according to us, well representative of such broadened perspective in the ecological sciences: "biodiversity" (in its different articulations) and "sustainable development".

The concept of *biodiversity* underline the need for every ecosystem of having a wide variety of life forms, in order to ensure its vitality over time (Barbabault, 1995; Bonnes & Bonaiuto, 2001). A primary implication of this concept is the importance of maintaining a necessary level of diversity among the different species of life that compose an ecosystem. Traditional approaches in ecological science have considered biodiversity with particular reference to non-human species; human activities are in such perspective mainly considered as a potential threat to biodiversity. Conversely, according to what we defined as a full ecology perspective, the fact that humans are considered as a part of ecosystems, leads to consider the role of human not only as a possible threat or loss of biodiversity, but also as a possible source of biodiversity gain. We can also affirm that the former kind of approaches stress more the non-human aspects of biodiversity, or "natural biodiversity", while the latter stress also the importance of human-specific aspects of biodiversity, or "cultural biodiversity".

Such broadened conception of biodiversity, together with the relationship between the biodiversity and the concept of "sustainability" have been also stressed with particular emphasis in the recent International Conference on Biodiversity and Society, held in New York, USA, in May 2001, jointly organised by the UNESCO and by the Columbia University of New York (cfr. Alfsen-Norodom & Lane, in preparation). Here the attendees of the Conference produced a declaration which explicitly underline the importance of adopting economic, social, cultural and political perspectives in conserving and sustainably managing biodiversity. At the same time was outlined need for participation of and support from local communities in order to achieve conservation and sustainable uses of biodiversity. The relationship between the "biodiversity" and "sustainability" concept are stressed with particular emphasis.

The concept of *sustainable development* was formalised at an international level by the publication in 1987 of the so-called "Bruntland report" by the World Commission on Environment and Development (WCED). Here sustainable development was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43).Sustainable development was then assumed as the main general aim to be reached at a global level by the international agencies since the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992. Although the concept of sustainable development has been criticised for being too vague, anyway there is a considerable agreement

among different scientific fields that it should remain the main aim to be pursued in the management of natural and human resources. Now sustainability is a trans-disciplinary concept which calls into question issues that are central in several social and human sciences and disciplines, ranging from economics, legal sciences, philosophy, psychology: within social and environmental psychology, in particular, some authors have recently proposed the term "psychology of sustainability" or "new ecological psychology" (Bonnes & Bonaiuto, 2001). These terms identify those theoretical and empirical contribution aiming at better understanding the psychological processes involved in the development of a positive environmental awareness and concern in people's use of natural resources. A considerable effort in the direction of supporting the above-mentioned «integrated perspective» in ecological science, as well the concept of sustainable development, particularly for what it concerns the institution and management of natural protected areas, came also from the UNESCO Program on Man and Biosphere (MAB), which will be briefly resumed with more detail in the next section.

Natural protected areas within international conservation programs: the UNESCO Program on Man and the Biosphere (MAB).

The MAB (Man and Biosphere) Program was launched at the beginning of the seventies by the Division of Ecological Science of UNESCO (di Castri et al., 1984). It was assumed as an interdisciplinary program of "applied research on the interactions between man and his environment; source of scientific knowledge needed by decision-makers for the management of natural resources" (Unesco-Mab, 1988, p. 12) aiming at supporting decision making and policy about environmental problems (Boniauto e Bonnes, 2001; Bonnes e Secchiaroli, 1995; di Castri et al., 1984). The program was also launching the role of the "full ecology" at the scientific and political level. MAB represented for many years one of the most innovative international and intergovernmental programs on human–environment interactions and provided a considerable aid in preparing the United Nations program for the previously mentioned 1992 Rio Conference. In that occasion the MAB program also supported the adoption of the "Sustainable Development" Program and Agenda 21 for the present millennium. There are some innovative aspects of the MAB Program which may be outlined here because of their implication for natural protected areas institution and management

Firstly, within the MAB, it was affirmed and actively supported since its beginning in the 70's, the need for scientific and practical collaboration between natural ecological science on the one hand and human social sciences on the other hand. Such need for a widespread interdisciplinary approach, also resumed in the name of the Program itself (Man and Biosphere), is also summed up well by the concept of the "Human Use System" (*HUS*, di Castri et al., 1984). The HUS concept was developed and proposed to be "as the new unit of analysis for the ecological sciences, to substitute the more traditional construct of ecosystem" (Bonnes, 1998). The Human Use System has been defined in terms of three basic dimensions ("space", "time", and "environmental perception"), thus stressing the importance of considering the human dimension of "environmental perceptions" for any environmental analysis. By mean of emphasising the concept of HUS it was underlined the importance of considering the human dimension involved in ecological processes; at the same time it was implicitly stimulated the development of new environmental perspectives within human social and behavioural sciences (like environmental psychology, environmental sociology, environmental anthropology, ecological economics, human ecology) (Bonaiuto & Bonnes, 2001; di Castri, Hadley, Damlamian, 1981; Whyte, 1984).

Other important innovative aspects to be outlined here, with implications for the field of natural protected areas, is that the MAB favoured the "full ecological" approach to also highly humanised or even damaged ecosystems. This orientation was actually uncommon within traditional approaches in natural science, which typically focused their attention to extremely "untouched" or "wild" environments, thus (at least implicitly) reinforcing the idea that human activities should be kept as far as possible separated from nature. Such inversion of perspective is also an important constitutive part of the "*Biosphere Reserve*" concept elaborated within the MAB Program with specific reference to the issue of natural protected areas (di Castri et al., 1984).

Originally the MAB Program was composed by 13 different Projects regarding various problematic topics about people-environment relations. One of them (the MAB Project n. 8 on Biosphere Reserves) is directly concerned to the institution and management of natural protected areas. In recent years, Program n. 8 assumed growing importance within the entire MAB, so that nowadays it constitutes its main part. Some of the main tenets of the Mab-Biosphere Reserve concept will be outlined in the next section.

The Mab-Biosphere Reserve concept: conciliating conservation and development

The importance of taking the «human and local dimension» into account in managing natural protected areas has been strongly emphasised by the Unesco-Mab Program, through the introduction of the Biosphere Reserve concept. Biosphere Reserves were proposed as a new way to conciliate both natural conservation and human (social, cultural, and economic) development through the promotion of sustainable practices in the management of protected areas. The multiple aims of the Biosphere Reserves are to protect natural biodiversity and resources, to function as a «field laboratory» for sustainable development, to promote the development of pro-environmental awareness and to encourage the involvement and active participation of people and local communities in the management of protected areas, by pursuing information, communication, education and training goals (Batisse, 1997; di Castri et al., 1984). The importance of human and societal aspects in designing and managing natural protected areas was recently reaffirmed in several occasions within the MAB Program. The Euromab Workshop held in Konigswinter (Kruse-Graumann, 1995), for example, has pointed out relevant suggestions to be fostered for the management of protected natural areas. These suggestions were received and formalised into a coherent "strategy" during the Unesco-Mab Conference on Biosphere Reserves held in Seville, Spain in 1995 (Unesco-Mab, 1995). Here 10 "key directions" for a more "human-oriented

management" of natural protected areas were established. These key directions, which formed the so-called "*Seville Strategy*", were synthesised into the following four main goals, to be pursued at the international, national and local level:

I) Use Biosphere Reserves to conserve natural and cultural diversity;

II) Use Biosphere Reserves as models of land management and approaches to sustainable development;

III) Use Biosphere Reserves for research, monitoring, education and training;

IV) Implement the Biosphere Reserves Concept.

More recently, in order to further emphasise this perspective and to provide guidelines for specific actions, the third Euromab Biosphere Reserve Coordinators' Meeting stressed the importance of promoting local involvement in the management activities of natural protected areas and the need of taking into account the social, cultural and economic dimensions, together with the bio-ecological dimension, for sustainable management of environmental conservation projects (Eisto et al., 1999).

2 Social psychological aspects in the institution and management of natural protected areas

Suggestions and recommendation developed within general policy programs as those reviewed above have provided insights which can be useful at a general level in the design and management of natural protected areas. Nonetheless, such insights need to be further developed by the support of specific research contribution from the different disciplinary fields dealing with people-environment interactions.

Environmental social psychology have traditionally focused on the cognitive, affective and behavioural process that guide people relations with their environment (Bonnes & Secchiaroli, 1995; Stokols & Altman, 1987). In the case of natural protected areas institution and management this can provide insights and suggestions for setting up more efficient strategies to support resource conservation behaviours among the different stakeholders of a protected area. If one looks at the more recent developments in the environment-behaviour domain, we can identify some basic evolution trends in the study of people attitudes and behaviours towards the natural environment: these trends are on the one hand pointing out the increasing development of a general *"environmental concern"* characterising people's attitudes and behaviours (Fransson & Garling, 1999) and, on the other hand, emphasising the growing importance of the theoretical perspective of *"commons dilemmas"* (Hardin, 1968; Van Vugt, 2002; Vlek, 1996). We will discuss such issues in with more details the next sections.

Pro-environmental attitudes, environmentally friendly behaviours and environmental concern

One of the most relevant research issues in the environment-behaviour domain regards the topic of "environmental concern". Efforts in this field are related to the growing importance that environmental problems have assumed, particularly those related to the misuse or over-use of natural resources (cfr., Fransson & Garling, 1999; Oskamp, 2000; Stern, 2000; Winter, 2000). Environmental concern refers to "both a specific attitude directly determining intentions or more broadly to a general attitude or value orientation" in a pro-environmental sense (Fransson & Garling, 1999, p. 370). Early contributions in this field have outlined how concern for nature and for environmental problems became an increasing widespread and shared set of beliefs in western culture (Dunlap & Van Liere, 1978). In order to explain this increased interest, Dunlap and Van Liere (1978) introduced the concept of a *New Environmental Paradigm* (NEP), which was gradually replacing the traditional *Dominant Social Paradigm* (DSP) or *Human Exemption Paradigm* (HEP) based on the classic idea of man dominating over or being exempt from nature. Some basic social-structural characteristics of environmental concern were also identified (Dietz, Stern & Guagnano, 1998). For example, young, urban, upper class, female subjects are found to be most committed to and aware of environmental issues, although more recent research seem to

suggest that environmental concern is generally increasing across different socio-demographic categories (Fransson and Garling 1999).

Recent works (Gagnon-Thompson & Barton, 1994; Stern and Dietz, 1994; Stern, Dietz & Guagnano 1995; Stern, Dietz, Kalof et al., 1995; Stern, Dietz, Abel et al., 1999) have tried to focus more on the social psychological aspects of environmental concern, and proposed Expectancy-Value models that refer to classical social psychological constructs like values and beliefs. Psychological research in this area, however, still needs to elaborate more clearly the place-specific character (and to more clearly articulate different levels of specificity) of pro-environmental attitudes and values (Bonnes, 1998; Fransson & Garling, 1999; Seligman, Syme & Gilchrist., 1994; Zube, 1991). Typically, research on environmental concern considers pro-environmental attitudes at a very general or "global" level, without taking into account the specific places/situations in which attitudes and behaviours occur. This limitation also helps to explain the general lack of correlation (normally below .40) between pro-environmental attitudes and behaviours emerging in most research in this field (Hines et al., 1986). Some authors, following Ajzen & Fishbein's (1977) principle of compatibility, point out the importance of overcoming this limit, stating that «if the attitude is not measured closely in time and at the same level of specificity as the behavior, there is seldom a strong relationship» (Fransson & Garling, 1999, p. 379). Conversely, when compatible measures of attitudes and behaviours are used, significant correlations between them are generally higher (Manstead, 1996). On the whole such developments in the conceptualisation of the relations between pro-environmentally attitudes and behaviours have proved to be suitable for predicting people behavioural intentions and actions in several environmentally relevant domains. But we want to proceed further along this line of increasing specificity: pro-environmental attitudes, just as other psychological processes, should be conceived as place-situated phenomena and therefore should be studied taking into account and dealing more directly with the places or situations they refer to or are embedded in (Corraliza & Berenguer, 2000). A place-centred approach in the study of people-environment interactions, which has been theoretically outlined by several authors (e.g.,

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Bonaiuto & Bonnes, 1996; Bonnes & Secchiaroli, 1995; Canter, 1977; 1984; 1998; Gifford, 1998; Hubbard, 1996; Russel & Ward, 1982; Stokols & Shumaker, 1981) could lead to a better understanding of people's choices and conducts which are relevant for the environment. The "social dilemmas" paradigm (Dawes & Messick, 2000, Vlek, 1996) which is increasingly being applied in the environmental domain, will be presented in the next section. Research on social dilemmas may thus help to deal with the apparent contradiction between people's positive concern for the environment and people's environmental unfriendly conducts.

Common goods, limited resources and social dilemmas

The well-being, quality of life and rights of individuals and groups regarding the environment often depend upon their access to a limited set of "common" resources which are shared with other individuals and groups. A theoretical approach which has been undertaken with regard to these issues refers to the Social Dilemmas (SD) paradigm. Social dilemmas can be defined as "situations in which each member of a group has a clear and unambiguous incentive to make a choice that when made by all members - provides poorer outcomes for all than they would have received if non had made the choice" (Dawes & Messick, 2000, p. 111). Social dilemmas are thus situations in which the individual interest is in conflict with a general collective interest: that is if everyone maximizes his own personal interest there will be a collective damage. Most environmental problems that seem to be relevant in the current agenda can be defined, and thus approached, as large-scale resource or "commons" dilemmas (Vlek, 2000). Commons dilemmas can be defined as situations in which a conflict arises between the present use/exploitation of a limited set of resources by single individuals, and the availability of the same set of resources for the collective. Frequently the individual-collective conflict in the exploitation of a limited natural resource has also a temporal dimension: that is the dilemma arise because maximising immediate individual gains produce a long-term collective damage. A natural resource will be extinguished if its capacity to renew is overcome by the exploitation rate. Conversely, limiting immediate individual gains

produce a long term collective benefit: the common resource will be guaranteed if its capacity to renew is not overcome.

It is frequent the case in which people may find that behaving in an environmentally negative way is more advantageous, ease, accessible, less costly at the individual level in the immediate. To an extreme extent, if people followed their narrow self-interest, as in the classical example illustrated by Hardin (1968), to behave in an anti-environmental way would be the rule and not the exception. However as some authors point out (Bonnes & Bonaiuto, 2001; Van Vugt et al., 2000), there are several cases in which dilemmas have been overcome by the cooperation among individuals, groups and communities. Research in this field has devoted a great effort for identifying strategies to limit the possible negative consequences of a SD. Some approaches have stressed the importance of "structural" strategies: that is to eliminate, or at least to reduce, the intrinsic conflict which forms the dilemma. Usually this can happen in turn by making the individualistic-competitive option less convenient or by making the collective-cooperative option more convenient. Solutions then may rely on financial incentives aiming at promoting cooperative behaviours or financial punishment aiming at limiting competitive behaviours. As a matter of fact, these kind of solutions are not always practicable because of legal, ethical, or technological constraints. Other approaches stressed the importance of "individual" solutions: cooperation in the exploitation of natural resources may be, under certain circumstances, enhanced by individual and social psychological variables: social identification, beliefs, attitudes, values, and norms. We will briefly discuss the role of social identity processes in commons dilemmas in the next section.

Identity processes

We have seen how the diffusion of pro-environmental attitudes among people in recent decades may constitute a positive premise for the institution and management of natural protected areas: we should expect that, given the fact that people share a positive concern for environmental conservation, also natural protected areas should be positively valued by the majority of people. At

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the same time a natural protected area may constitute a commons dilemma especially for the local people living inside it; thus we might also expect that natural protected areas could be also negatively valued, in particular by people who have a direct interest in the exploitation of local natural resources (i.e. land, forests, agricultural products and so on).

A third social psychological issue that can be related to people's concern on natural protected areas refers to identity processes: as we will see from the result of some case studies, identity issues may be, depending to specific contextual variables, both positively and negatively related to people support for natural protected areas.

Identity processes constitute a classical field of study in the social psychological research tradition, and can be traced back to the very beginnings of this discipline (Twigger, Bonaiuto & Breakwell, 2002). Recent contributions have focused on the links between identity processes and environmental perception/evaluations and attitudes toward the built and the natural features of the environment (Bonaiuto & Bonnes, 2000; Bonaiuto, Breakwell & Cano, 1996; Boniauto, Carrus, Martorella & Bonnes, in press; Brown, 1988; Devine-Wright & Lyons, 1997, Lalli, 1992). These contributions have highlighted how environmental perceptions/evaluations of different groups and categories of people may be linked with those aspects of identity that are more related to actual "places" in which people live. Environmental attitudes and behaviours, and place related identity can vary in relation to different social groups and categories.

In the more specific field of "social dilemmas", empirical research have documented the positive effects of social identification upon co-operation in commons resource use (see Van Vugt, 2002). There is consistent evidence that increased in-group identification and/or strengthened social ties may result in greater cooperation in commons dilemmas situations; this effect has been explained by the tendency of people which are more identified with a group to act on behalf of it (thus focusing on the collective outcomes of their actions) instead that as single individuals (thus focusing on the personal outcomes of their actions). Anyway a strong in-group identification can have his reverse side of the coin. The fact is that increased identification may enhance cooperation

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only when the dilemma involves *one* individual and *one* group; conversely, when two or more groups are involved in a dilemma, identification may enhance inter-group conflict and thus produce negative outcomes for the collective. Brewer & Schneider (1990), for example, showed that, under an intergroup competition situation, a strong ingroup identification can have negative impacts on resource use in commons dilemma. This can be the case of multiple groups competing for a same pool of limited resources, or when specific local groups are subject to top-down environmental policies (which may be the case of land use regulations and protection of natural areas). Identity processes in these cases may form the basis for environmentally relevant behaviours which are ingroup stereotypical and biased, and thus disadvantageous for the entire community.

The relationship between environmental attitudes and behaviours and identity processes could be well applied also to natural protected areas, in particular as far as the institution of new protected areas is concerned. Land use changes like the institution of natural protected areas in some specific human territories are expected, at least ideally, to move natural areas in the direction of environmental and social sustainability. Thus, providing the new institutional "status" of protected area to a specific zone, should enhance its distinctiveness in ecological terms. Such transformations should generate in the public, and in particular in people living around and inside these territories, positive attitudes both towards that specific protected area and towards the institution of protected natural areas in general. At the same time, a place specific perspective implies that relevant environmental changes (actual or potential), that positively affect the specific features or the "distinctiveness" of a specific environment or territory, will also positively affect resident's placerelated identity. Social Identity Theory (Brewer, 1991) considers achieving a positive or optimal distinctiveness for the self as one of the basic motivations leading individuals to identify with a specific group. Similarly if a specific territory or place (or system of places) gains a positive distinctiveness then people living there should also find their place identification increased. In other words, there should be a positive relation between pro-environmental attitudes at both specific and

general level and positive identification with territories involved in the institution of natural protected areas.

One should also expect to find differences between different categories of people. Local residents, for example, who have always lived in the area in which the transformation occurs, should be more affected (in terms of attitudes and identity) than people who are less locally involved ("non-local"), since they live nearby or are temporary residents such as tourists/visitors.

However, also according to a place-specific perspective (Bonnes & Secchiaroli, 1995; canter, 1977; Russel & Ward, 1982), other factors such as local (economic, cultural, social) activities in the exploitation of human and natural resources may play an important role in determining the positive or negative responses of the local public to the proposed institution of natural protected areas. The institution of a natural protected area can be perceived by local residents as limiting or threatening the local activities, such the economic ones, in particular when the sustenance of the local population is based on natural resource use and traditional rural activities (farming, cattle breeding, forestry). Social psychological literature on environmental concern has shown, for example, that rural residents are usually less ecologically oriented than urban inhabitants (Bogner & Wiseman, 1997; Dietz et al., 1998; Fransson & Garling, 1999). One possible explanation for this phenomenon has been called the "nature-exploitation theory", according to which rural populations are usually more likely to see natural resources as a possible source for daily sustenance than urban inhabitants (Bogner & Wiseman, 1997). In this case, specific groups of local residents may oppose protected areas.

Moreover protected natural areas can be often perceived by local communities as an imposed decision, or as an unfair interference of external authorities in local domains of activities and affairs. The institution of a protected natural area can be perceived by its residents as a potential threat for their local activities (related to the economic sustenance and/or to daily leisure activities), and thus become a threat to political/administrative autonomy. By this way also local residents' identity as members of a local group might be called into question or made salient and, in a certain

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way, might be threatened. When people are faced with a threat to their identity or when they perceive of themselves as victims of an unfair process as members of a specific group, they may increase their level of identification with that group as a defence or coping strategy (Brewer & Brown, 1998; Ellemers, Wilke & van Knippenberg, 1993; Taylor, Moghaddam, Gamble & Zellerer, 1987; Wright, Taylor & Moghaddam., 1990). Normally, as Brown (1995, p.174) noted, "threats to people's social identities should be responded to by increased attempts to differentiate the ingroup positively from outgroups". In a similar vein, research has highlighted how cohesiveness arises when an external enemy (actual or symbolic) or a threat is perceived (Dion, 1979; Harrison & Connors, 1984; Levine & Moreland, 1998).

Perceiving the institution of a natural protected area as damaging local (and economic) activities, as limiting the free access to and use of resources in a territory, and as an unfair external interference or a threat to local freedom of activities and autonomy (and thus for identity) could lead specific local social groups and categories to reinforce their place identity and to develop negative attitudes toward the institution itself (generally and specifically). To summarise, we may argue that groups of people with different kinds of local positions or place specificity in an environment (local residents, non-local or nearby residents, tourists) and/or different activities in the territories involved (in terms of their more or less prevalent economic interest) can be expected to have different reactions to specific proposed environmental transformations such as the institution of protected natural areas, both in terms of attitudes and in terms of identity.

We will illustrate these processes by presenting the results of some Italian case studies in the next section.

3 Some case studies from the Italian experience

The Italian situation of natural protected areas may be of particular interest. Several new protected natural areas have been instituted in the last decade with the active support of national and

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regional authorities. The proportion of territories which are subject to protection increased from the 0.63 % during the 60's, to the present 10 % (Ferroni, 2001). Such a great national political effort, however, did not always encountered an equally strong local support, so that the institution process have been difficult for many of the new protected areas. Within this general context we started a research program aimed at investigating people's attitudes toward the institution of natural protected areas and the relationship between such environmentally relevant attitudes and behaviours and local identity processes.

The Gennargentu National Park

A first case study concerns the institution of Gennargentu National Park (GNP). Gennargentu is a mountain region, located in the central eastern part of the island of Sardinia. From a natural and bio-ecological point of view, the area is characterised by the presence of several endangered plant and animal species and rare local endemic species. The main economic activities are farming and cattle breeding, often still conducted with archaic production methods. Although the first systematic protection proposal for this area dates back to more than 30 years, however also due to the strong opposition of some local inhabitants, the area was formally designated as a National Park only in May 1998.

We assessed public response to the park by a qualitative-exploratory (Carrus & Bonnes, 1999) and by a quantitative study (Carrus, Bonaiuto & Bonnes, 1999; Bonaiuto et al., in press): in particular our aim was to investigate attitudes toward the protected natural area and regional identification among different categories/groups of people living in and near the park area. Both inhabitants of some small villages located inside the park area (locals) and inhabitants of the larger metropolitan area of same region of Sardinia (the city of Cagliari) located about 200 kilometres from the park area (non-locals) participated to the studies.

Data for the qualitative study (N=40) were gathered in February-March 1997 using a semistructured interview track consisting of seven open-ended questions developed on the basis of some

interviews previously conducted with local opinion leaders. Interviews were recorded with an audio tape. The questions addressed various aspects of people's attitudes towards protected natural areas in general and more specifically GNP.

A content analysis revealed local inhabitants' negative attitudes toward the GNP. To explain their position, local inhabitants used mainly "anthropocentric" arguments (Gagnon-Thompson & Barton, 1994), expressing the belief that the national park would damage the rural economic activities of the area. The negative attitudes were also supported by the belief that the park would lead leisure activities (e.g. going to the country or trekking or hunting) to be forbidden or extremely difficult. Another key aspect of local inhabitants' opposition was related to the process followed by the national authorities for instituting the protected area. They felt the institution of the park had affected their "autonomy" since the decision was taken by the national government without the prior consent of the local communities. When asked which would be their preferred form of management for a possible protected area in the Gennargentu zones, local residents indicated a municipal or regional park, managed directly by local municipalities, or at least by the regional administration. Most of the subjects felt that, by instituting the GNP, the national government was "stealing the land" to the local communities.

An opposite pattern emerged for the subjects living in the city of Cagliari. This group evaluated positively the institution of the GNP. They used both "ecocentric" and "anthropocentric" arguments to account for their favour, expressing the belief that the GNP would be useful for protecting the nature, for providing the possibility for contact with nature and for enhancing the economic development of the region. They also indicated their choice for a national park (instead of a municipal or regional park) as the right form of management for the protected area, without expressing the belief that the decision-making processes for instituting the park were unfairly affecting the autonomy of the local communities.

Such a polarised pattern was confirmed by the result of the quantitative survey. Data were gathered in August-September 1998, using a self-report questionnaire comprised of Likert-type

scales (measuring attitudes the GNP and regional identity) and by question concerning sociodemographic characteristics (sex, age, job, level of education, place of residence, length of residence). Participants (N=115) were contacted personally by one of the authors, were asked to participate in a survey on protected natural areas, and were assured for the anonymous character research. It was specified that filling in the questionnaire would have taken about 15-20 minutes.

The main results are shown in table 1. Local inhabitants expressed negative attitudes toward the institution of the GNP and high regional identity; conversely, inhabitants of the city of Cagliari expressed positive attitudes toward the GNP and lower regional identity. A one–way ANOVA revealed significant differences (p < .01) between the mean scores of locals and non locals in the two scales.

Table 1: locals vs. non locals comparison in the Gennargentu National Park study

	Means and S.D.		F	dof	р
	Locals	Non-locals			
Positive attitudes toward specific park	2.3 (1.4)	4.0 (1.0)	61.3	1, 114	<.01
Regional identity	4.7 (1.2)	3.7 (1.0)	24.3	1, 114	<.01

Mean scores are comprised between 0 (completely negative attitudes, low identity) and 6 (completely positive attitudes, high identity).

3.2 The Tuscan Archipelago National Park

A second study was conducted in the Tuscan Archipelago National Park (TANP). Our main aim here was to confirm and extend to a different context the preliminary findings of the GNP study. The TANP study provided a different regional context, a different kind of natural protected area and a larger and more articulated sample of local people. TANP this is a coastal-marine protected area (formally instituted in July 1996) located on small islands near the coast of Tuscany. The prevalent economic activity in this area is tourism. As in the GNP case, we predicted local residents to espress negative attitudes toward the park. Moreover, if perceived as threatening or negative and imposed from outside, the institution of the natural protected area could affect local people's regional identity as in the previous study. Perceiving the institution of the protected area as negative or threatening the local economic activities and autonomy can also be related to people's different place activities and local uses of the park territory. We predicted that people who are more involved in economic activities would have more negative attitudes toward the institution of the protected natural area than people involved in pro-ecological or pro-environmental activities. Moreover, our prediction was also that those more involved in economic activities, as they could be more likely to perceive the protected area (which is proposed by a National authority) as a threat to their freedom of activities and thus to their placerelated "autonomy", should also reinforce their level of local (regional) identification more than other categories.

The two main groups of subjects considered were: a group of local residents living on the main island of the archipelago (Elba Island) inside the park area, and a group of non-local residents living in the small urban agglomerate of the same region (S. Vincenzo), located on the coast of Tuscany in front of the archipelago, outside the park area.

Within the local sample, we differentiated between three different subgroups of subjects. Following a distinction proposed by Graumann and Kruse (1990), we identified a first subgroup, composed of people belonging to pro-environmental associations, "ecologists". A second subgroup was composed of people belonging to local business associations, defined as "economists". A third control subgroup was composed of people not belonging to any relevant association, defined as "no belonging".

Data were gathered in December 1998 through a self-report questionnaire consisting of Likert-type scales analogous to the ones used in the previous study. Participants (N = 854) were personally contacted and asked to participate in a survey research project on protected natural areas.

For what it concern the local-non local comparison, results were very similar to those of the GNP study (see table 2).

Table 2: locals vs. non lo	ocals comparison in the	Tuscan Archipelago National	Park study
	1	1 0	

	Means and S.D.		F	dof	р
	Locals	Non-locals			
Positive attitudes toward specific park	2.9 (1.8)	4.4 (0.9)	171.9	1, 846	<.01
Regional identity	4.7 (0.7)	4.3 (0.7)	42.4	1, 852	<.01

Mean scores are comprised between 0 (completely negative attitudes, low identity) and 6 (completely positive attitudes, high identity).

Regarding the comparison among the different subgroups of local subjects, the economists expressed more negative attitudes towards the specific park and higher regional identity than the ecologists; no-belonging were in an intermediate position, as shown in table 3. A Duncan post-hoc comparison have shown a significant (p < .05) difference between each of the three groups in all the four scales.

Table 3: comparison among different locals subgroups in the Tuscan Archipelago National Park study

	Means and S.D.			F	dof	р
	Economis t	no-belonging	ecologist			
<i>Positive attitudes toward specific park</i>	1.5 (0.9) ^a	2.7 (1.7) ^b	4.4 (1.3) ^c	195.2	2, 528	<.01
Regional identity	4.9 (0.7) ^a	4.6 (0.7) ^b	4.5 (0.8) ^c	15.6	2, 532	<.01

Mean scores are comprised between 0 (completely negative attitudes, low identity) and 6 (completely positive attitudes, high identity). In the same row means with different superscripts are different for p < .05.

The Geominerarian Park of Sardinia

A third study was conducted in another new Italian protected area: the Geominerarian Park of Sardinia. We were interested in extending the findings that emerged in the previous studies to a third kind of protected area. The Geominerarian Park of Sardinia was established in 1997 by the Sardinian Regional Administration, with the aim of enhancing the value of geological and precious mineral resources spread out over the entire regional territory, and at the same time protecting and recovering the complex old system of related extractive industrial sites. In Sardinia, traces of mineral extraction can be dated back to prehistoric eras; extractions have continued without interruption during the entire course of the history so that mineral heritage mining have become during the centuries a relevant part of the regional culture and identity. In current years the production of mining industry started to progressively decrease at the beginning of the 1960s, so that only a few sites are nowadays still productive. A protected area was instituted by the Sardinian Regional Administration and the Sardinian Mining Agency in 1998. The park, formally recognised by the Italian Government and by UNESCO, was intended to protect these particular sites from the disruption due to abandonment of extraction activities. In particular it aimed at preserving the geological and mineral resources as a typical local heritage and resource which characterise the region in a natural and historical sense (according to what we defined as a "full ecological" perspective in the previous sections of this paper). The park was also instituted in order to provide possible alternatives (e.g., eco-tourism) for the poor economy of the zone, strongly endangered because of the crisis in the mining industry. We were asked by the Sardinian Mining Agency to assess people's attitudes toward the park. We thus carried a research program with a design similar to those adopted in the previous studies. In a preliminary qualitative phase we interviewed 15 local residents. Results seem in this case to indicate a different pattern with respect to the previous studies. In fact a content analysis of the interviews revealed that the park institution was recognised as a valuable strategy for overcoming the crisis in the mining industry and providing new alternatives for the economy of the region. At the same time, local people stated that the institution

of the park would preserve the cultural and architectural heritage related to the history of mining activities in the area.

In a successive quantitative phase we considered both locals and non-locals residents (N=316), using the same kind of questionnaire and procedures of the previously studies. Also in this quantitative phase results are different from those of the *Gennargentu* and *Tuscan Archipelago* studies. In fact we did not find a divergent or conflicting pattern of pro-environmental attitudes and regional identity between local and non-local inhabitants of the park. Statistical analyses (one-way ANOVA) did not show significant differences between the two groups, as shown in table 4. Both local and non-local inhabitants expressed positive attitudes toward the specific park and moderately high levels of general environmental concern (this variable, which was not included in the previous studies, has been measured with an Italian adapted version of Dunlap and Van Liere's NEP scale of 1978). Local and non local residents were also characterised by similar levels of regional identity.

	Means	F	dof	р	
	Locals	Non-locals			
General environmental concern	4.2 (0.8)	4.4 (0.9)	2.298	1, 311	n.s.
<i>Positive attitudes toward specific park</i>	4.4 (0.9)	4.2 (0.8)	3.716	1, 299	n.s.
Regional identity	3.8 (0.9)	3.7 (0.8)	0.150	1, 304	n.s.

Table 4: locals vs. non locals comparison in the Geominerarian Park study

Mean scores are comprised between 0 (completely negative attitudes, low identity) and 6 (completely positive attitudes, high identity).

We explained the differences between the results of three case-studies presented (Gennargentu, Tuscan Archipelago and Geominerarian Park) by the specific "place-differences" among these natural protected areas. In fact, the main "object" of protection is what distinguishes between the Gennargentu and Tuscan Archipelago parks on the one hand and the Geominerarian park on the other hand. The former are more traditional "natural" parks, focused on natural bio-

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ecological features, and intended to protect places and "natural" territories on which local populations base some of their economic activities. The latter is aimed at protecting geological and mineral resources which are strongly integrated with the human local activities and culture. Anyway such resources are no longer directly related to the actual economic activities and daily sustenance of local populations but could become again partially active in this sense through the institution of the park. Therefore, in this case, local inhabitants' disfavour may be less likely to emerge, since "commons dilemma" situations regarding the exploitation of local resources and territories are less probable. On the contrary, the institution of the protected area is recognised by the local inhabitants as a potential tool for both cultural and economic development. Another important difference between this case and the previous two is that a more participatory approach was adopted by decision-makers right from the very early stages of the Geominerarian Park institution proposal.

5 Summary and conclusions

The institution and management of natural protected areas is a relevant issue in the current "sustainable development" environmental agenda, as reflected by the more innovative approaches in ecological and environmental sciences promoted by U.N. organisations as UNESCO. Such land-use transformations and management can have relevant implications for people's daily lives. This is particularly true for local inhabitants of these territories as well as for those who have only temporary interactions with these places, such as nearby residents, tourists or visitors. Human response (particularly of locally involved people) to such environmental transformation is a crucial issue for environmental managers and policy decision-makers.

Ideally, from the point of view of decision-makers, natural protected areas should be evaluated positively by the majority of the people involved and should also contribute toward developing a more stable positive concern about nature and environmental conservation issues amongst the public. However individuals and social groups may also negatively evaluate natural

protected areas in particular when these convey dilemmas between individual's perceived selfinterest and the collective interest. The daily activities that people carry on in their places (in particular those activities related to their economic sustenance) can frequently become a source of dilemmas within a protected area. Usually, environmental conservation and economic activities are perceived as conflicting goals; thus, the concept of "sustainability" becomes crucial in attempting to reconcile these goals (di Castri, 2000).

Social and environmental psychological studies, fostering a place-specific perspective, can thus be useful for understanding the different reaction patterns of individuals and social groups toward the institution of natural protected areas.

Research on environmental concern, for example, from early theories to more recent contributions (Dunlap & Van Liere, 1978; Dietz et al., 1998; Fransson & Garling, 1999) have showed that positive attitudes toward the natural environment are nowadays shared by a large number of people. Nonetheless, research have also clearly illustrated the existence of individual and group differences in attitudes toward the natural environment and global environmental issues. Moreover, evidence from environmental social psychological literature has highlighted how a relevant part of our identity is related to the physical and symbolic features of the places in which we live and stay (Proshansky, Fabian & Kaminoff, 1983; Bonaiuto & Bonnes, 2000; Twigger et al., 2002). As a consequence, attitudes towards the environment and towards changes and transformations happening in the local environment tend to affect identity process, as generally highlighted by recent theoretical and empirical contributions in this field (Bonaiuto et al., 1996; Devine Wright & Lyons, 1997; Dixon & Durrheim, 2000; Lalli, 1992; Twigger-Ross & Uzzell, 1996). The same processes have recently been documented also for environmental changes concerning the institution of natural protected areas (Carrus & Bonnes, 1999; Boniauto et al., in press). Results of our case studies in fact point out also that different local/social groups and categories tend to hold different attitudes toward the same local natural protected area. Moreover these different groups are characterised by different levels of identification with these specific

places in which natural protected areas are instituted. Further research is however needed within this perspective in order to better understand and articulate the social psychological processes involved in people support or opposition for natural protected areas, with the aim of moving toward "sustainable" practices in the design and management of natural protected areas.

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