

Searching the Conditioning Factors Explaining the (In)Effectiveness of Protected Areas Management: A Case Study Using a SWOT Approach

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Based on long-term fieldwork, we report a descriptive SWOT (strengths, weaknesses, opportunities, and threats) analysis performed by a public agency that manages a protected area (PA) system in a densely populated area (Rome, central Italy) to highlight the core limits in this PA's management effectiveness. The key result of the analysis is that the limits of the management effectiveness and the obstacle in setting improvement strategies can be basically derived from the hierarchical command-and-control government approach and from the adopted management model. The main hindrance to the implementation of a multilevel collaborative management appears to be the "institutional stickiness" of the managing public agency in shifting from its hierarchical government approach to a governance one. Having observed the presence of operational gaps among the best solutions in the scholarly mainstream, the governing capability of the managing authority, and what happens in the field, we suggest that an answer to aligning these factors could be the creation of more fluid conditions for bottom-up initiatives—for instance, by monitoring the multibenefits of PAs for local communities or by making available to the public the economic evaluation of public goods.

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From the second half of the past century, management of complex and nonlinear systems (e.g., socioecological systems; sensu Holling, 1973) by means of top-down

command-and-control approaches, frequently led to unexpected negative effects and societal/environmental crises (Holling and Meffe, 1996). Indeed, the traditional command-and-control approach was increasingly criticized in natural resource management, especially in the case of protected areas (hereafter, PAs) (e.g., Folke et al., 2005; Wondolleck and Yaffee, 2000). Several alternative solutions have been proposed, like collaborative management (Borrini-Feyerabend and Borrini, 1996; Wondolleck and Yaffee, 2000), adaptive comanagement (Olsson, Folke, and Berkes, 2004), and adaptive governance (Folke et al., 2005).

Even if the governance approach is today considered the key factor for the sustainable management of an ecosystem and/or landscape (e.g., the PA case), moving away from a government command-and-control approach implies a shift from a political-administrative hierarchy to different types of collaborative structures based on the participation of a wider range of nongovernmental entities through the coordination of intersector relations and less rigidity in the processes' initialization and finalization (Peters, 2000; Plummer and Armitage, 2007; Wesselink and Paavola, 2008).

The multilevel and collaborative approach that characterizes PA governance is today considered essential (Ludwig, 2001) because the only effective management of local natural resources is that based on a local community learning process (Reed, 2008; Secco, Pettenella, and Gatto, 2011; Southern et al., 2011). These aspects are also linked to the fact that the PAs in highly populated nations, like Italy, are mainly rural and often mountainous or hilly, and that management of natural resources has to be considered on a landscape scale from the perspectives of planning (Battisti, 2003; Lindenmayer and Fisher, 2006; Pino et al., 2000) and policy (Franco, 2007).

Based on this premise, we expect that a prevailing top-down, command-and-control government approach, in con-

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trast to an adaptive governance approach, would negatively affect PA management effectiveness (Hockings et al., 2006; Lockwood, 2010). Ineffective management is an internal weakness that leads to anthropogenic threats impacting natural areas, makes conservation strategies inefficient, and wastes allocated economic resources. In fact, beyond the scientific mainstream, the governance approach is expected to support PA management with all its strategic and operational tools (Borrini-Feyerabend, Kothari, and Oviedo, 2004; Hockings, Stolton, and Dudley, 2000, 2006; Leverington and Hockings, 2004; Machlis and Tichnell, 1985; The Nature Conservancy, 2000).

Although there have been many assessments of effectiveness in PA management, these analyses have often focused on the preliminary context phases (i.e., emphasizing the local policy, socioecological values, and threats), whereas the evaluation of the planning and management processes has received less attention (Leverington, Hockings, and Costa, 2008).

In this brief, experience-based commentary, we report a descriptive analysis of internal and external conditioning factors that characterize and affect the management of a PA system in a densely populated area (Rome, central Italy). The screening was aimed expressly at detecting the core limits of PA system management effectiveness and was supported by the same public agency that manages that system. We based the screening basically on our personal long-term direct research and management field experience. We used a SWOT (strengths, weaknesses, opportunities, and threats) descriptive approach because it provides a very quick overview of key policy points requiring decisions (Hockings, Stolton, and Dudley, 2000) and has been widely used to critically analyze policy and management practice (e.g., Orr, 2011). We used the analysis results to comment on the existing gap between the best knowledge and normative tools of the scholar mainstream and the concrete results obtained in applying them (see Kroll, 2007).

Materials and Methods

This commentary is directly based on the 15-year-long field experience (1998–2013) of experts and technicians engaged in a public agency (the Province of Rome Environmental Service; hereafter, PRES) managing a system of PAs located in the Province of Rome (the Latium region, about 1,700 km² in central Italy). The PA system was established in 1997 by a Regional Law (no. 29, October 6, 1997; Filpa, 2000) and consists of six nature reserves 20–60 km from Rome:

1. Macchia di Gattaceca e del Barco Nature Reserve (997 ha near the towns of Mentana, Monterotondo, and Saint Angelo Romano), a remnant agroforest (*Quercus cerris* dominant) mosaic landscape in the Campagna Romana
2. Nomentum Nature Reserve (850 ha near the towns of Mentana and Fonte Nuova), an archipelago of remnant oak fragments in suburban Rome
3. Monte Soratte Nature Reserve (410 ha near the town of Sant'Oreste), a calcareous (karstic) mountain complex along the Tiber River Valley, characterized by a Mediterranean maquis and *Quercus ilex* forests
4. Monte Catillo Nature Reserve (1,320 ha near the town of Tivoli), a sub-Appennine mountain with thermoxerophilous and mesophilous vegetation, pastures, and mosaics (Guidi, 2007, pp. 221–224)
5. Villa Borghese di Nettuno Nature Reserve (40 ha near the town of Nettuno), a *Quercus ilex* forest within a historical park near the Tyrrhenian coast
6. Palude di Torre Flavia Natural Monument (40 ha near the towns of Ladispoli and Cerveteri), a small remnant wetland with open waters, reed (*Phragmites australis*) beds, and rush beds (Battisti, 2006)

All PAs are ecologically different and of medium to high ecological value, hosting many species and habitat types of conservation concern included in the Annex of European Union Directives (79/409/CEE, the Birds Directive; and 92/43/CEE, the Habitat Directive) (Battisti, 2006; Filpa, 2000; Guidi, 2007).

We used a SWOT descriptive approach to organize our observations and opinions (Hill and Westbrook, 1997; Leigh, 2009). The SWOT analysis has been adopted for very different purposes (Halla, 2007; Orr, 2011) and can actually be used in every decision process if a final status (objective) has been defined.

In the adopted SWOT descriptive approach (Figure 1), we first listed the strengths (S) and weaknesses (W) of the managing authority (internal conditioning factors, which affect activities and processes) and the threats (T) and opportunities (O) of the real socioeconomic world in which the PAs are embedded (external conditioning factors, which affect activities and processes); and then suggested the matching of strengths and opportunities to determine some advantages and to convert threats into opportunities and weaknesses into strengths (Hill and Westbrook, 1997).

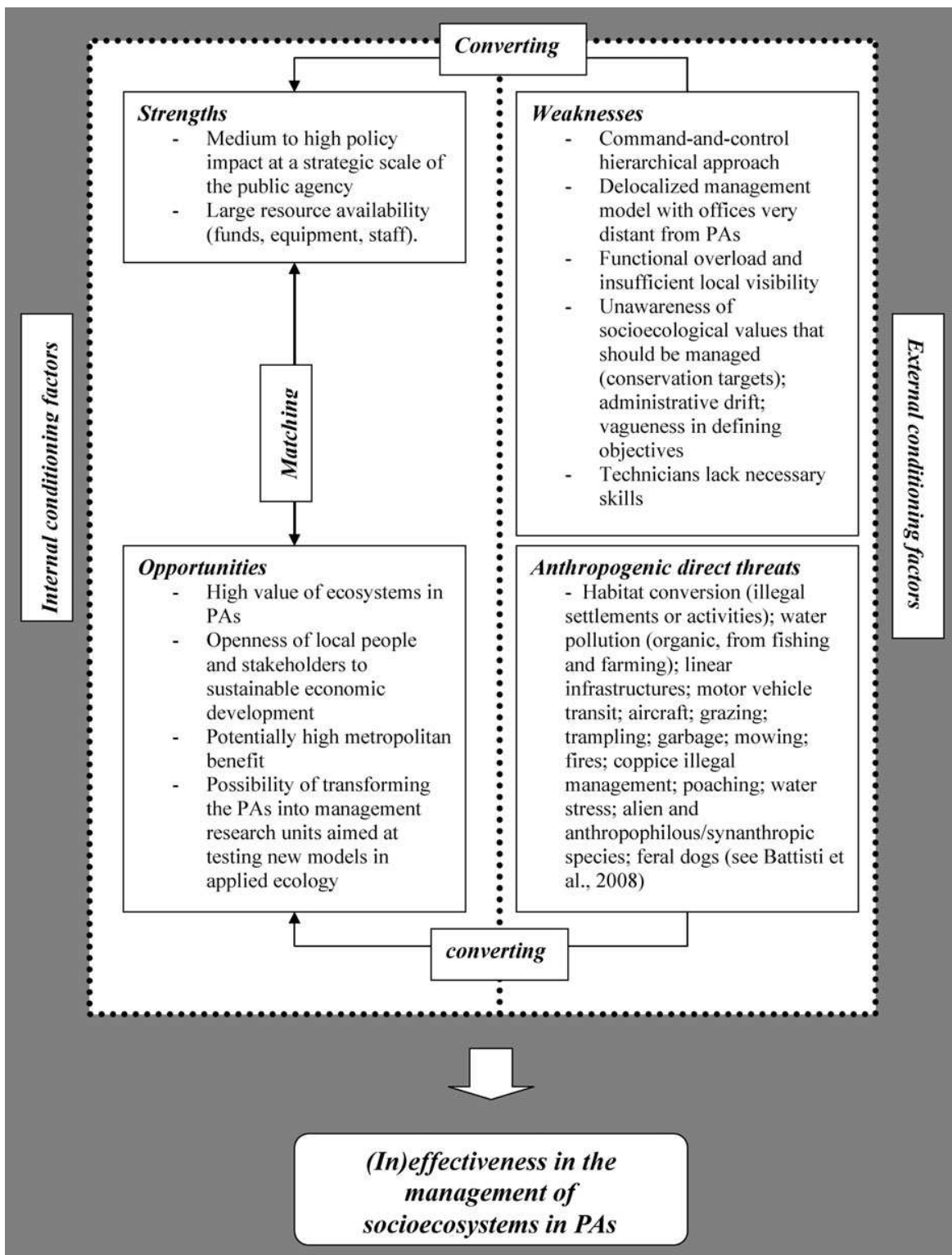


Figure 1. Conceptual framework of internal and external condition factors (i.e., the internal or external factors that may affect activities and processes promoted by the public agency; SWOT analysis) related to the system of protected areas (PAs) in the province of Rome (central Italy), managed by the Province of Rome Environmental Service (PRES).

Results

Strengths

1. *Policy impact on a strategic scale.* The PRES, which is responsible for territorial policy, is an operational office of the Province of Rome public agency—that is, at an intermediate hierarchical level between the Regional Agency (Regione Lazio) and the individual local municipalities. Therefore, it has an institutional and strategic role in coordinating the local territorial administrations (municipalities) toward the management of biodiversity and public goods in the PAs. This intermediate (medium to high) hierarchical scale of government is sufficient for implementing strategies—for example, at the landscape level—embedding most of the ecological processes threatening the conservation targets.

2. *Resource availability.* The PRES has a relatively large public budget and independent expenditure capacity related mostly to its use of buildings, funds, equipment, and human resources (staff).

Weaknesses

1. *Management model* (for the gap between localization of the PAs and management of the operational unit, lacking site-specific operational staff). The six PAs studied are each very different socioecologically, hosting very different conservation targets and communities, and dispersed within a large territory (from the Apennines to the Tyrrhenian coast). They are small to medium in size (range, 40–1,320 ha) and therefore highly vulnerable to different general, local, and context-specific anthropogenic threats and pressures. Nevertheless, the management model of these PA systems is based on a single distant central office (the PRES) in Rome (40–60 km from each PA). Moreover, the PRES has several other environmental responsibilities (many unrelated to PAs), and its executive is simultaneously the chief director of all six PAs. This management model has a single chain of command, which can lead to a bottleneck in specific responses to critical local problems in PAs. Moreover, in contributing to the slowdown of the technical, accounting, and administrative procedures, the PRES does not have a specific staff (legal service, rangers, etc.) devoted to PA management but instead uses the resources (legal office, vehicle fleet, etc.) of its general offices in other departments of the administration (the Province of Rome public agency) that are located in Rome and thus even farther from the PAs.

2. *Command-and-control, top-down hierarchical approach.* In the public administration, the hierarchical organizations are permeated with the command-and-control paradigm that is the government's inherent institutional tool. The PRES is a public office with a typical hierarchical government approach, which tends to be vertically structured more than horizontal, proactive, and delegative. This approach slows procedures, demotivates public officials (especially technicians), and results in a loss of accountability, all of which strongly reinforce the aforementioned weaknesses.

3. *Functional overload and insufficient local visibility.* Given the distance of the PRES central office from each PA, the technicians cannot guarantee the continual and constant monitoring and educational training of visitors, who arrive mostly during afternoons, evenings, and on weekends, when many PAs are more vulnerable (e.g., to threats and abuses).

4. *Unawareness, vagueness, and administrative drift.* We found awareness and vagueness problems that directly result from the first two weaknesses listed. The PRES executives are basically unaware of (a) the effective presence, type, ecological role, and number of local PA conservation targets (both for the ecological and the social systems), (b) the presence, type, dynamism, and size (or magnitude) of the driving forces and direct threats (*sensu* Salafsky et al., 2008) that affect these conservation targets; (c) the active role of the PRES in developing and monitoring adaptive management strategies (see Hockings et al., 2006; Margolis and Salafsky, 1998); and (d) their role as an operational unit in using applied ecology to manage a real-world PA, characterized not by linearity but by uncertainty and complexity. This lack of awareness leads to vagueness in defining the management objectives and tends to privilege an administrative office routine, thus reducing the fieldwork and basic/applied research. The result is a delay in learning about field conservation problems and subsequently delayed adaptive strategic responses (see McCleery, Lopez, and Silvy, 2010). This *administrative drift* leads the offices to act in a circular self-referential way, more absorbed by interior affairs (e.g., staff management) than in facing the real world outside (e.g., stakeholders and biodiversity).

5. *Lack of PA management skill.* The unawareness throughout the hierarchical organization, in turn related to the first two weaknesses listed, leads to the lack of vocational training at the administrative and technical levels and consequently to a general loss of skills needed to manage PAs effectively. Moreover, PA emergencies tend to be faced in a bureaucratic, deterministic way, which results in extemporary

and delayed reactions to the complex, nonlinear dynamics of the real world.

Opportunities

1. *The value of ecosystem services.* PAs are nature sites of high value that are important in reducing the deficit in nature faced by the new urban generations and in enabling the supply of several ecosystem services. These public and common services and goods have been recently estimated, mapped, and made publicly available (Provincia di Roma, 2011).

2. *Development of the local economy.* PAs could represent a local economic opportunity if incentives to collective action (e.g., by farmers or forest owners) in monitoring and maintaining ecosystem functions would be developed (e.g., participation in the monitoring plan and development of basic facilities for tourists).

3. *Openness of local communities.* Local communities (their people and stakeholders) living within or beside the PAs have shown great interest and open-mindedness toward the establishment of PAs, with continual attention maintained by the school systems, which would benefit from the demand for guided educational tours.

4. *Availability of a large metropolitan benefit.* All of the PAs are very near Rome (about 4 million inhabitants) and can easily be of benefit to a large public. These areas are also attractive as specific sociological targets (e.g., for birdwatchers, nature photographers, wilderness tourists).

5. *Research units aimed at testing new management models.* Since technical personnel are now present, each PA may be considered an applied ecology research unit focused locally on (a) the assessment and monitoring of the local biodiversity values (composition, structure, and dynamics), (b) the analyses of the ecological processes (monitoring the regime of natural disturbances and anthropogenic threats in time and space), and (c) the definition of new models of adaptive management and monitoring. These PAs actually represent training sites for research in wildlife management that are also supported by universities (e.g., Battisti, Luiselli, and Teofili, 2009; Battisti et al., 2008; Marini, Ceccobelli, and Battisti, 2011; Zacchei, Battisti, and Carpaneto, 2011).

Anthropogenic Direct Threats

All the PAs are near the Rome suburbs and therefore continually exposed to many local anthropogenic direct threats

that vary in size, duration, frequency, and magnitude. Considering only one of the PAs studied (Palude di Torre Flavia Natural Monument), more than 15 types of anthropogenic direct threats have been detected and managed in the last decade by the PRES (Battisti et al., 2008).

Matching and Converting

The institutional role and position of the PRES as PA management office appear to be quite adequate in assuring the synergies between strengths and opportunities. The PRES has enough resources available to promote local economic development on a participative basis and a relatively high hierarchical position so as to avoid the possible influence of local conflicts of interest (i.e., at the municipal level).

The basis of the high number of anthropogenic direct threats is the urban influence of the Rome metropolitan area. Although this situation cannot be modified, at least some threats associated with the pressure induced by people visiting the PAs (e.g., motor vehicle transit, trampling, feral dogs) can be transformed into opportunities if properly managed with local community involvement.

Indeed, most of the weaknesses could apparently be converted in strengths because they basically are a consequence of inefficient organization inside the PRES administration. In fact, as our analysis shows, all of the weaknesses and obstacles detected in matching strengths and opportunities or converting threats in opportunities can actually be (a) derived from the command-and-control approach, and the corresponding managing model; and (b) be considered the typical bureaucratic collateral damage of a hierarchical government approach in which decisions are transmitted top-down by the public administration (Plummer and Armitage, 2007). Actually, most of the weaknesses found could be initially isolated and then resolved by a governance approach based on a shared consensus by different nongovernment stakeholders through coordination of multilevel relationships, as well as greater flexibility in process initial-ization and finalization (Wesselink and Paavola, 2008).

For example, the delay in local impact response and the detachment from local communities in PA development initiatives could be easily converted through site-specific adaptive management. Otherwise, the lack of awareness and skills described (weaknesses 4 and 5) could be bypassed quickly by using the same approach.

Discussion and Conclusion

The results of the SWOT analyses showed that the conservation objectives of the PAs considered have not been fully pursued, mainly because of internal conditioning factors. Given that this commentary is aimed at detecting the key limits for effective management of the entire PA system considered (Hockings et al., 2006; Leverington, Hockings, and Costa, 2008), it was beyond this report's scope to detail how to establish adaptive multilevel management within each PA or how to build site-specific W-O and W-T or S-O and S-T strategies (see Orr, 2011). We limited these issues to the considerations in the Matching and Converting section of this article.

If we assume, along with the scholar mainstream, that multilevel participative management is the best solution for the sustainable management of the PAs and that this has to be pursued through a governance approach, we can also determine that the present lack of governance implies a management limitation.

Actually, based on our analyses, we conclude that the main hindrance to effective management of the PA system considered can basically be traced back to the the PRES difficulty in shifting its approach from a government one, typically based on a top-down hierarchical system, to one based on genuine governance. Therefore, we found that the problems of the management system significantly constrain the effectiveness in the management process, as Hockings, Stolton, and Dudley (2000) have stated. In this sense, the "institutional stickiness" detected that inhibits the readiness of organizations to change and the resistance toward accepting and adopting novel approaches (regardless of how efficient they are considered by the scholar mainstream and how socially acceptable they might be) are very well documented (Boettke, Coyne, and Leeson, 2008; Slocombe, 1993). Therefore, one of the main strategies for overcoming the weakness highlighted by our analysis should be a shift toward the support of an urgent governance approach by the managing authority of the PAs.

Yet, this task should not be underestimated. In fact, the principles of the governance approach are not only well established in the scholar mainstream but are declared, although not followed, in the same PA management plans.

Some of those who have researched complex socio-economic systems (e.g., Beinhocker, 2006) have highlighted that, in an uncertain world, the success in strategies depends on an organization model that is reversible, resilient,

and adaptive. In this sense, a top-down hierarchical model in nature resource (PA) management may be ineffective. Perhaps a bottom-up approach could be a solution (e.g., Contoli and Battisti, 2012), at least if it is pragmatic (Reed, 2008; Smith, 2008).

Finally, the monitoring of multibenefits by local individuals or community stakeholders may create enough pressure to eliminate those slowdowns at the intermediate government scale. Otherwise, informing local communities and citizens of the economic evaluation of the public goods impacted by the ineffectiveness of PA management could be a democratic, transparent tool for individuals or organized groups of citizens to promote the evolution of the public administration toward using a governance instead of the top-down approach in PA management. It is advisable, in this case, that the same public administration managing the PAs (i.e., the PRES) make these kind of estimates publicly available (Franco and Luiselli, 2013).

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