Chapter 13
Including Threats in Adaptive Management

Conservation Action Planning (CAP) has been developed by the international organization known as The Nature Conservancy as a model of adaptive management dedicated to professionals in the field of conservation biology and environmental management. It constitutes one of the three main models supporting the TNC strategic framework called Conservation by Design (TNC 2000 and subsequent documents) to which we refer you for further reading.[1]

The CAP model has been developed in order to define appropriate strategies for preserving key targets (species, communities, ecosystems, and processes) in specific conservation sites. It has been applied by TNC in reserves and in other conservation sites around the world. It has also been adapted and applied by WWF and many NGOs and government agencies.[2]

The basic assumption of this approach relies on the concept of *adaptive management* carried out through the application of constant monitoring programs which assess the effectiveness of the actions taken on specific conservation sites. The CAP model can be applied by a project team whose work is arranged according to a series of different steps aimed at better developing the actions needed to achieve the conservation goals.[3]

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[1]The other two major models are the *Major Habitat Assessment* and the *Eco-regional Assessment*. They are mainly focused on the selection of objectives and priorities, whereas CAP is mainly based on the choice of the most appropriate strategy useful for achieving the objectives. However, as far as result assessment is concerned, the three models all share similar aspects (Esselman 2007).

[2]Such an approach is contained in the *Open Standards for the Practice of Conservation* (aka, *Open Standards*) which has been defined thanks to the support of the major associations and government agencies around the world. Information and materials are available on http://www.conservationmeasures.org. Interestingly, the Open Standards methodology entails a specific software called Miradi which is capable of handling all information concerning a given project in a dynamic and coherent way. It can also prove a useful tool to share the project findings at various levels.

[3]The main steps are the following: *project scope*, *focal elements*, *stress and source*, *strategy*, *success* (see the box in this section).

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CAP is performed by assessing the context constituted by biodiversity values and threats and the results obtained in terms of management effectiveness and efficiency. All this is integrated into an extensive process including specific strategies development and application (Hockings et al. 2000 and subsequent documents).

In the evaluation process the main and most relevant steps can be identified as follows:

(i) Clear definition of conservation targets, of their *status* or *condition* and intervention priorities setting;
(ii) Identification and rating of *threats* to priority targets;
(iii) Monitoring or using other methodologies to gain information on the current conservation status of the targets;
(iv) Applying the findings to the management of the site through a process of adaptive management.

The following box shows the overall process which, as indicated in point 4., includes a step pertaining to the subject of this book (identification of priority threats, here defined as *critical threats*; TNC 2000). This schematic summary can be useful to define the management procedure of a site.

A. **Project definition**

1. **Identifying the technicians involved in the project**

- Selecting a core project team and assigning roles
- Identifying other planning teams, consultants, or advisors as needed
- Identifying a leader

2. **Defining project *scope* and conservation *targets* (project scope stage)**

- A short descriptive text and map or the area of interest
- A statement of the overall vision of the project
- Selection of targets (not more than 8) and explanation of the choices made

B. **Rating of targets and threats and definition of the conservation strategy (system focal elements stage)**

3. **Viability rating of selected targets**

- Selection of at least one key ecological attribute and one indicator for each target
- Definition of an acceptable variation range for each attribute
- Determining the current and desired status of each attribute
- Brief documentation of viability assessments and any important research needs

4. **Identification of critical threats (stresses and sources stage)**
    - Identification and rating of the stresses affecting each target
    - Identification and rating of the stress source for each target
    - Determination of critical threats
5. **Development of conservation strategies (strategies stage)**
    - Performing a situation analysis including indirect threats, opportunities, and stakeholders
    - Highlighting (by writing a text or graphically) the hypothesized links among indirect threats, direct threats, opportunities, and affected targets: defining causal chains for each relation target/threat
    - Defining specific objectives for each threat or attribute of the target and, if deemed useful, for each factor directly or indirectly associated with the project success
    - Defining one or more strategic actions for each conservation target
6. **Identifying the monitoring tools (success stage)**
    - Compiling a list of indicators and methods to assess the status of selected targets and threats which are currently under study
    - Compiling a list of indicators and methods to verify the effectiveness of each conservation action

C. **Applying conservation and monitoring strategies**

7. **Developing work plans**
    - Compiling a list of actions and monitoring modalities
    - Task assignment to specific individuals; determination of a timeline
    - Brief summary of project capacity and a rough project budget
    - If necessary, specifying objectives and actions for obtaining sufficient project resources
8. **Implement**
    - Actions
    - Monitoring

D. **Utilizing results to adapt and improve**

9. **Analyzing, updating, and modifying**
    - Appropriate data analysis
    - Possible updating of project feasibility and threat rating
10. **Learning and sharing**
    - Identification of the most appropriate audience and communication methods

In situations of high uncertainty, time, and resource limitation, it may not be possible to obtain data from original samplings. Therefore, in such a case it is necessary to rely on expert-based approaches. To such an end, in the CAP process a specific evaluation system based on scores has been applied in many contexts.

Initially the project team's task consists of the definition of conservation targets and key values, by identifying key ecological attributes and indicators for each target. In the CAP process, the attention is focused on conservation targets, i.e., on populations, species, communities, and ecological systems chosen to better represent and comprise the biodiversity of a site (e.g., protected areas, or other sites of conservation importance, such as the Natura 2000 sites). Targets constitute the fundamental components to set objectives, implement strategic actions, and to assess conservation project effectiveness. Targets can be considered the most important strategy goals, or, from a more generic point of view, they can be treated as indicators. In the latter case the assumption is that, by preserving selected targets, the conservation of a large part of the biodiversity present in a site or territorial area could also be ensured. So, targets will have to be as representative (focal) as possible at different spatial and temporal scales (TNC 2007). It is advisable to select them from coarse-grained categories (e.g., communities or ecosystems) and then progressively chosen among those 'nested' into broader categories (e.g., individual species belonging to communities or individual communities included into ecosystems).

Each target has its own characteristics, here defined as key ecological attributes (KEAs), which can be utilized to define and assess its viability and integrity. In general, such attributes are outstanding and critical characteristics of target ecology and biology, which, if lacking or modified, are likely to cause target extinction in the short-medium term. Each ecological attribute can be measured either directly or indirectly by indicators (Parrish et al. 2003; TNC 2007). For KEAs and indicators an acceptable variation range needs to be defined.[4]

Detailed instructions to implement this method are provided in training courses and materials are available on the Internet. The Excel CAP sheet, also available online, is a useful tool for implementing the general framework. It contains instructions, tips, and examples useful for analyzing information.

[4]Also utilizing categories, such as for example: *Very Good* (the indicator functions within an excellent ecological scenario and needs little intervention to maintain its status within its natural range of variation); *Good* (the indicator is functioning within its natural range of variation, although it may require some intervention for its maintenance); *Fair* (the indicator lies outside of its natural range and requires intervention for its maintenance; if unchecked it will be vulnerable to serious degradation); *Poor* (allowing the indicator to remain in this condition for an extended period will make it impossible to get it back to an acceptable condition—because the process would be too complicated, costly, or simply not reversible).

References

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