

Systematic Conservation Action – A Consensus Framework

(after Sarkar 2004, Table 2.1, pages 20-22)

1. Compile and assess biodiversity data for region:

- Compile available geographical distribution data on as many biotic and environmental parameters as possible at every level of organization;
- Collect relevant new data to the extent feasible within available time; remote sensing data should be easily accessible; systematic surveys at the level of species (or lower levels) will usually be impossible;
- Assess conservation status for biotic entities, for instance, their rarity, endemism, and endangerment;
- Assess the reliability of the data, formally and informally; in particular, critically analyze the process of data selection.

2. Identify biodiversity surrogates for region:

- Choose true surrogate sets for biodiversity for part of the region; be explicit about criteria used for this choice;
- Choose alternate estimator-surrogate sets that can be (i) quantified; and (ii) easily assessed in the field (using insights from Stage 1);
- Prioritize places using true surrogate sets;
- Prioritize places using as many combinations of estimator-surrogate sets as feasible;
- Assess which estimator-surrogate set is best on the basis of (i) efficiency and (ii) accuracy.

3. Establish conservation targets and goals:

- Set quantitative targets for surrogate coverage;
- Set quantitative targets for total network area;
- Set quantitative targets for minimum size for population, unit area, etc.;
- Set design criteria such as connectivity;
- Set precise goals for criteria other than biodiversity.

4. Review existing conservation areas:

- Estimate the extent to which conservation targets are met by the existing set of conservation areas.

5. Prioritize new places for potential conservation action:

- Prioritize places for their biodiversity content to create a set of potential conservation area networks;
- Optionally, starting with the existing conservation area networks as a constraint, repeat the process of prioritization to compare results;
- Incorporate design criteria such as minimum size and connectivity.

6. Assess prognosis for biodiversity for each potential targeted place:

- Perform population viability analysis for as many species using as many models as feasible;
- Perform the best feasible habitat-based viability analysis to obtain a general assessment of the prognosis for all species in a potential conservation area;
- Assess vulnerability of a potential conservation area from external threats, using techniques such as risk analysis.

7. Refine networks of places targeted for conservation action:

- Delete the presence of surrogates from potential conservation areas if the viability of that surrogate is not sufficiently high;
- Run the prioritization program again to prioritize potential conservation areas by biodiversity value;
- Incorporate design criteria such as minimum size and connectivity.

8. Perform feasibility analysis using multiple criterion synchronization:

- Order each set of potential conservation areas by each of the criteria other than biodiversity;
- Find all best solutions;
- Discard all other solutions;
- Select one of the best solutions.

9. Implement conservation plan:

- Decide on most appropriate legal mode of protection for each targeted place;
- Decide on most appropriate mode of management for persistence of each targeted surrogate;
- If implementation is impossible return to Stage 5;
- Decide on a time frame for implementation, depending on available resources.

10. Periodically reassess the network:

- Set management goals in an appropriate time-frame for each protected area;
- Decide on indicators that will show whether goals are met;
- Periodically measure these indicators;
- *Return to Stage 1 – iterative process of adaptive management requires self-correcting feedback*

The sequence of stages presented here reflects Sarkar's integrative historical analysis of the history of conservation biology as a discipline. As such, it provides a consensus view that synthesizes aspects of both North American and broader global approaches (particular those originating in Australia). For additional details, consult Sarkar's paper.