

The ConsNet Portal 1.0

Systematic Conservation Planning Primer

[CONSNET.ORG](#)[BIODIVERSITY AND BIOCULTURAL CONSERVATION LABORATORY](#)[SCP BLOG](#)

© 2006 Vanessa Lujan, Trevon Fuller, Alex Moffett, and Sahotra Sarkar. Tutorial written by Vanessa Lujan, Trevon Fuller, Alex Moffett, and Sahotra Sarkar with assistance from James Justus, Chris Kelley, Chris Margules, and Samraat Pawar.

M6: Conservation Targets and Goals

[Print Friendly PDF](#)

Learning Objectives: At the completion of this module, learners should be able to assess the general concepts of setting conservation area network targets and goals within the general framework of systematic conservation planning.

- The most general goals of systematic conservation planning are the representation and persistence of biodiversity.
 - Economy in achieving these goals is also of paramount importance (e.g., limited time, monetary resources, etc) (Margules and Sarkar 2007),
 - Representation of biodiversity must include all surrogates, including those species that are currently harvested at unsustainable rates by human beings and species whose habitat contains valuable natural resources, the extraction of which is incompatible with the persistence of the species.
 - Often, representation of those species within or around urban areas or larger human populations is lacking in conservation planning because of the economic and political cost to certain stakeholders.
 - This leads to ad hoc reserve planning (improvised based on immediate needs/biases/etc.)
 - Inclusion of goals other than representation and persistence of biodiversity is a result of the negotiation process between stakeholders within systematic conservation planning. Careful assessment of the dominant goals (representation and persistence) in a particular plan is needed to use resources economically.
 - India: only about 50% of the total area of Tiger Reserves may contain tigers. However, the remaining 50% still continues to consume resources required for maintenance of the conservation areas of the region.

Box 6.1

Regional Ecosystems are unevenly represented in the conservation area network in Queensland, Australia. The total percentage of Regional Ecosystems represented in protected areas is 69 %, but only 39 % are represented more than once.

The Representation of Regional Ecosystems in the Reserve System of Queensland (Australia)

Bioregion	Regional area (ha)	Protected area ¹ (ha)	No. of RES in bioregion	No. of RES in protected areas	% RES in protected areas	% RES in >1 protected area ¹
1 Northwest Highlands	6 950 000	369 100	41	27	66	22
2 Gulf Plains	21 377 000	525 300	83	25	30	10
3 Cape York Peninsula	11 548 000	1 594 100	211	177	84	54
4 Mitchell Grass Downs	22 787 000	238 900	53	21	40	15
5 Channel Country	24 594 000	1 634 700	56	44	79	52
6 Mulga Lands	19 097 000	464 900	66	47	71	39
7 Wet Tropics	1 850 000	310 400	105	71	68	41
8 Central Queensland Coast	1 151 000	142 300	37	33	89	59
9 Einasleigh Uplands	12 808 000	226 900	46	26	57	11
10 Desert Uplands	6 882 000	153 800	58	25	43	9
11 Brigalow Belt	35 158 000	730 400	183	110	67	39
12 Southeast Queensland	8 231 000	341 800	145	125	86	49
13 New England Tableland	341 000	26 500	21	14	67	19
TOTAL	172 774 000	6 759 100	1 085	745	69	39

¹ Protected areas current to 28 February 1998.

(Margules and Sarkar 2007)

- The central goal of systematic conservation planning has a second component: persistence. Representation alone does not suffice.

- Even if a conservation plan represents the surrogates at the targeted levels, not planning for the persistence of those surrogates defeats the purpose of biodiversity conservation.
 - Threats to persistence include habitat loss caused by the conversion of habitat to agricultural use as well as biological and environmental causes (e.g., competitive species for food resources, habitat resources, ranges, etc; climate changes; etc.)
- In the context of systematic conservation planning, the target of representation for a surrogate is defined as the exact amount of that surrogate that must be present within the units of the conservation area network.
 - Targets can be absolute numbers (for instance, number of occurrences of a species) or fractions of occupied habitat (for instance, 75 % of the extant habitat of a rare species).
 - "Targets" as used here are not "target areas" they are targets of representation.
 - Different surrogates may have different targets.
 - For example, for some common species, low targets may be appropriate.
 - Highly endangered species may require high targets (perhaps as much as every recorded presence of the surrogate).
 - If targets are defined as a fraction of habitat, caution must be exercised when selecting the time for measuring the extent of the habitat. Ideally, the extent prior to anthropogenic habitat loss should be measured. Otherwise, one can satisfy a target just by destroying some of the existing habitat of a surrogate.
 - Targets of representation are also required for area prioritization exercises and for assessing complementarity.
 - The World Wildlife Fund and IUCN (Dudley et al. 1996) have advocated a target of 10 % for all forest types on Earth, that is, conservation areas should cover 10 % of all forests.
- Setting targets of representation is the most important "unsolved" problem of systematic conservation planning.
 - Targets often reflect pragmatic political judgments rather than biological considerations.
 - Ideally, targets should incorporate vulnerability/viability considerations.

- Setting targets of representation is where scientific ecology may contribute to conservation planning most.
 - **Allometric relationships** can potentially be used to establish minimum habitat requirements for many mammals. For these species, as body size increases so does the relative size of the range.
 - However, even here, one must move from habitat relationships of individual animals to adequate habitats for viable populations.

- The following design criteria constitute subsidiary biological goals of conservation areas (they are less important than targets of representation).
 - Size: the larger, the better. However, increasing size indefinitely is not cost-effective.
 - Shape: the **null model** should be that compactness is better. However, this depends on the type of ecosystem. For example, if a plan requires a riparian habitat, the conservation areas should be located to follow the flow of the river.
 - Connectivity: in general, connectivity is desirable. However, connectivity may ease spread of epidemics.
 - Dispersion: conservation areas should be separated in space to sample the entire landscape.
 - Dispersion in geographical space is distinct from dispersion in environmental space. Both are important.
 - This design principle has rarely been used in practice.

- Socio-political goals: conservation areas exist in larger social and political contexts.
 - In general, social and political influences manifest themselves in various types of costs that affect systematic conservation planning's broad goals of biodiversity representation and persistence.
 - Socio-political goals include different factors:
 - Inclusion or exclusion of human presence
 - Community-based conservation
 - Sustainable harvesting of certain species allowed
 - At times, wildlife species that may need protection can be found in or near large

human populations.

- Traditional agro-ecosystems may conserve certain aspects of biodiversity as well as serve main purpose of food production.
- Watershed protection areas and recreational areas may protect elements of biodiversity.
- In the example of the Keoladeo National Park (see **Example 6.1**) and Communal Conservancies in Namibia (see **Example 6.2**), it is evident that conservation area networks are not homogeneous but in fact, heterogeneous based on the particular characteristics of the larger environmental, social, and political contexts that surround the network.

Example 6.1

Keoladeo National Park in Rajasthan (India)

This national park is an artificial wetland that originally housed different bird species and cattle. In the 1980s, grazing by the cattle was forbidden to promote the bird diversity of the region. After the ban, Paspalum grass and opportunistic weedy species became overgrown as they were not grazed down by the cattle. This caused the bird richness to decrease as a result of unsuitable food sources. Soon after, the ban on cattle grazing was revoked and subjective data suggests that bird populations have improved. (Lewis 2003; Gadgil and Guha 1995; Vijayan 1987)

Example 6.2

Communal Conservancies in Namibia

The purpose of communal conservancies is to conserve wildlife in addition to using the wildlife sustainably. In Namibia, communal conservancies called for the pooling of resources to use local wildlife sustainably. Before implementation of a communal conservancy plan, the plan must be deemed viable ecologically, socio-culturally, and economically. The next steps include composing a local management committee which decides the rules and regulations for the conservancy plan. Once these goals are established, the communal conservancies obtain legal rights of ownership over the wildlife and may also proceed to obtain hunting or tourism rights. The first communal conservancy in Namibia was Nyea Nyea, which was established in 1998. Communal conservancies can be used as a supplement to conservation area networks. (Margules and Sarkar 2007)

Assess Your Knowledge

M1: Introduction to Conservation Area Networks
M2: Systematic Conservation Planning Overview
M3: Stakeholder Identification and Involvement
M4: Data Compilation, Assessment, and Treatment
M5: Surrogacy Identification and Analysis
M6: Conservation Targets and Goals
M7: Review Existing Conservation Areas
M8: Place Prioritization
M9: Vulnerability and Persistence Analysis
M10: Network Refinement Protocol
M11: Multiple Criteria Analysis
M12: Implementation of Conservation Plan
M13: Periodic Network Reassessment
M14: Conclusion and Review - Future Directions

Systematic Conservation Planning Modules

M1: Introduction to Conservation Area Networks
M2: Systematic Conservation Planning Overview
M3: Stakeholder Identification and Involvement
M4: Data Compilation, Assessment, and Treatment
M5: Surrogacy Identification and Analysis
M6: Conservation Targets and Goals
M7: Review Existing Conservation Areas
Module References

M8: Place Prioritization
M9: Vulnerability and Persistence Analysis
M10: Network Refinement Protocol
M11: Multiple Criteria Analysis
M12: Implementation of Conservation Plan
M13: Periodic Network Reassessment
M14: Conclusion and Review - Future Directions
Module Glossary

[Welcome Page](#)