Stages in the planning process and the roles of software
What is conservation planning?

- Conservation areas: areas managed for the persistence of biodiversity and other natural values
- Conservation planning: decisions about the location, configuration and management of conservation areas
- This includes decisions about strict reserves, off-reserve management and restoration
What is systematic conservation planning?

- Explicit (not necessarily objective)
- Explicit about goals and objectives, reasons for deciding on areas that need conservation, which areas to protect first etc
- A key characteristic is the use of complementarity
Richness | Rarity | Size | Minimum set
--- | --- | --- | ---
100 | x 1 | x 3
Planning with complementarity

• Selecting new conservation areas so that each one complements the others in the features (e.g. species, vegetation types) it contains

• Analysis possible with pen and paper for small data sets

• Analysis of large data sets benefits from special-purpose software
Definition of conservation planning software …

- Computer programs that, at minimum
  
  (1) are used to guide decisions about conservation action for biodiversity AND
  
  (2) can identify sets of complementary areas needed to achieve conservation targets for biodiversity

- but note that some systems identify the contributions of areas without targets
Geographic scales ...
Environments ...
Stages in the planning process (and the role of software)

1. Scope and cost
2. Identify and involve stakeholders
3. Identify goals
4. Compile data
5. Set conservation targets
6. Assess existing conservation areas
7. Select new conservation areas
8. Implement conservation action
9. Maintain and monitor
Stage 1 - Scoping and costing the planning process

- Identify the boundaries of the planning region
- Assemble the planning team
- Design and cost stages 2-7 (note that the cost of implementation will only be known after stage 7)
- Designing and costing involve choices about feasible tasks within each stage and specific approaches to each
- Costing might motivate fundraising
Stage 1 … continued

Roles of software

• None?

And note that the choice of software should ideally follow from the choice of tasks; otherwise software might limit the feasible tasks
Stage 2 - Identifying and involving stakeholders

Who are stakeholders?
* people affected by existing or new conservation areas
* people who can contribute information to the process
* people responsible for implementation and management (e.g. national, provincial and local agencies and non-government organisations (NGOs))
Stage 2 ... continued

Why involve stakeholders?
* information
* ownership of the process
* understanding decisions
* facilitation (political, financial)
* potential to reduce or compensate for impacts
* mainstreaming
* implementation logistics
Stage 2 ... continued

Roles of software:
* encouraging involvement by demonstrating scope for real participation
* NOTE 1: consultation can shape software design and its application
* NOTE 2: part of consultation can be training and making software available for stakeholders to build their own scenarios
Stage 3 - Identifying conservation goals

- Statements of values
- Perhaps begin with a broad “vision” statement
- Refine into more specific statements (e.g. representation of ecosystems, persistence of wide-ranging species)
- Goals other than biodiversity conservation
- Insulate from data and targets
Stage 3 … continued

Roles of software
• None?
Stage 4 - Compiling data

Key data requirements:

• boundaries of the planning region (but note the importance of extra-regional views)
• biodiversity features (or “targets”)
• planning units (for most applications)
• data matrix (features X planning units)
<table>
<thead>
<tr>
<th>Area</th>
<th>Feature 1</th>
<th>Feature 2</th>
<th>Feature 3</th>
<th>Feature 4</th>
<th>Feature 5</th>
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Stage 4 … continued

Other important types of data (spatially explicit):
* threats to biodiversity
* costs
* condition ("quality", "integrity" etc)
* other data related to implementation (e.g. tenure, importance to local communities)
Stage 4 … continued

Roles of software:
* importing data in the correct format
* giving users access to raw and processed data during the planning process
* exploring the effects of decisions about which data to use
* testing biodiversity surrogates
Stage 5 - Formulating conservation targets

Roles of targets:
* interpretations of goals through the filter of available data
* limitations
* need for periodic review
Stage 5 … continued

Targets for biodiversity pattern
- Land types, species records, species models

Targets for biodiversity process
- Population dynamics and species persistence
- Species interactions (e.g. pollination, predation)
- Movements of animals (complementary habitats, migration)
- Patch dynamics
- Adjustment to climate change
- Evolutionary processes
Stage 5 … continued

Roles of software:

* allow users to import (and perhaps later vary) one or more sets of targets for use in the planning process (more than one set might be required by policy makers)

* testing the effects of targets on the effectiveness of biodiversity surrogates
Stage 6 - Reviewing existing target achievement

- Usually necessary to build on existing conservation areas, not begin from scratch
- Identifies fixed points for consolidation
- Measures the achievement of targets in existing conservation areas (gap analysis)
- Can extend gap analysis by identifying the vulnerability of “gap” features
- Can consider forms of protection
No. forest types

IAP tenure target protected (%)
<table>
<thead>
<tr>
<th>Species</th>
<th>Strict reserves</th>
<th>Off-reserve 1</th>
<th>Off-reserve 2</th>
<th>Off-reserve 3</th>
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<td>0.0</td>
<td>0.4</td>
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</tbody>
</table>
Stage 6 … continued

Roles of software:
* recognise the contributions of existing conservation areas to targets
* map existing conservation areas as a basis for designing an expanded system
Stage 7 - Selecting new conservation areas

Two basic problems:
1. Finding sets of areas that achieve targets
2. Deciding which targets to achieve if limits on resources for conservation management do not allow all targets to be met

* making decisions about location & design
* applicable to strict reserves, off-reserve management, restoration
Stage 7 … continued

Roles of software:

• producing indicative systems of conservation areas
• serving as decision-support for planners (e.g. maps of options, guidance for design, monitoring progress to targets, reporting)
• Note the value of interactive decisions
• identifying tradeoffs
• producing alternative conservation scenarios
Stage 8 - Implementing new conservation areas

- Turning the plan into a system of conservation areas on the ground
- Preparation should have begun at the start of the process (stakeholders, anticipating constraints and opportunities)
- Issues include: refining boundaries, forms of protection, scheduling, managing day-to-day changes to the plan
Stage 8 ... continued

Roles of software:
• costing the plan
• estimating time to completion (policy relevance)
• guiding decisions about scheduling
• guiding decisions about forms of protection
• managing day-to-day issues (development applications, unexpected losses, boundary changes, unforeseen opportunities)
Stage 9 – Maintaining and monitoring conservation areas

- Managing established conservation areas to ensure that biodiversity and other values are maintained
- Clear management objectives required
- Management deals with internal pressures (e.g. visitation) and external pressures (e.g. isolation by vegetation loss, invasion by weeds, hydrological impacts)
- Monitoring of selected indicators necessary to ensure that objectives are being achieved
Stage 9 ... continued

Roles of software:

- Place individual conservation areas in the context of the planning region, both spatially and in terms of contribution to targets
- Guide decisions about internal zoning of activities, recognising regional context