

The missing link(s)

Matrices and causal flow diagrams for sorting information

Convergent thinking for the rational analysis stage

- Find patterns, relationships and order in the information/data surfaced
- Use thinking tools for organizing information
- E.G: *Matrices, Causal Flow Diagrams*

The Matrix

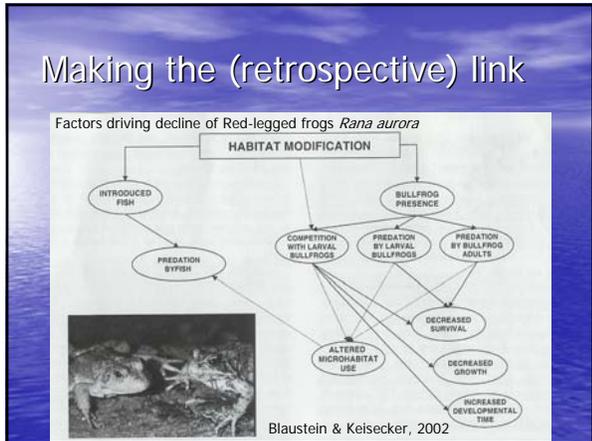
- Separate elements of a problem
- Categorize information by type
- Compare types of information
- Compare pieces of information of the same type
- See patterns among the information



Pink rail example- see OHP

The Giant Pink Rail

3 pops of the species are distributed through an island chain. Human populations have established on islands A and C. Strangely only the population on C utilises pigs which free range. Pigs were also introduced to island B but rats have ended up on all 3. Only the rail population on A is stable both of the others are declining. Why is the rail population declining on B and C?



Causal flow diagrams...

So, how does it work?

- Identify major factors- *what do we know and what do we think could be happening?*
- Identify how factors are linked
- Are links direct or inverse?
- Diagram links
- Analyse the diagram with all its links

Example...



- Understanding the decline of the Jersey agile frog (*Rana dalmatina*)

The Jersey population has been declining in both range and numbers since the early 1900s. In the 1970s there were only seven active breeding sites remaining; by the 1980s this had dropped to two. One of the remaining sites was lost in 1987 due to a lethal spill of agricultural pesticides into the pond.

Habitat loss and fragmentation continues to threaten the remaining frog population, removing important non-breeding sites for adult frogs and causing barriers to migration routes and potentially lethal obstacles, namely roads. The reduction in both water quality and quantity threaten the remaining breeding site. There is a constant risk of domestic and agricultural pollutants running into the ponds. As the frogs breed in ephemeral ponds, the lowering of water levels can impact on the length of time the water body remains each year. Predation on spawn and tadpoles by native palmate newts is known to occur, though predation from feral ducks is perhaps of greater importance. Feral pole-cats and domestic cats are known to take adult frogs. The introduction non-native grass frogs (*Rana temporaria*) and European green frogs (*Rana Lessonae*) are likely to outcompete the native species due to their higher fecundity.

Example...



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Example...



- Which factors are linked?

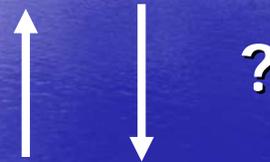
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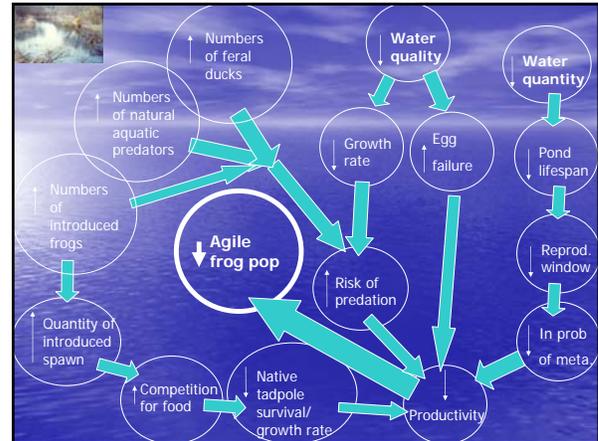
Example...

- Are the links direct or inverse?

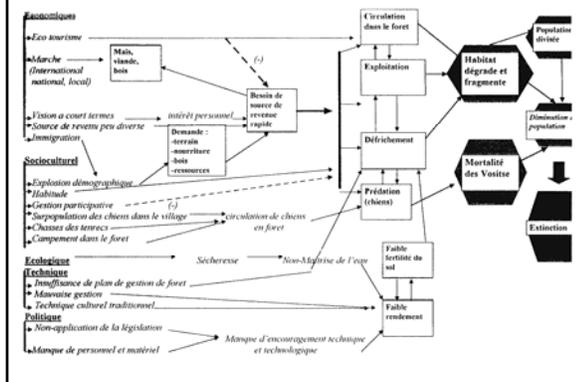


Example...

- How do all the links fit together...?



Jumping rat example



Your exercise

- When you have enough information, generate either a matrix or a causal flow diagram or both in order to *converge* (gain a sense of the pattern, system interconnections and discover causalities).