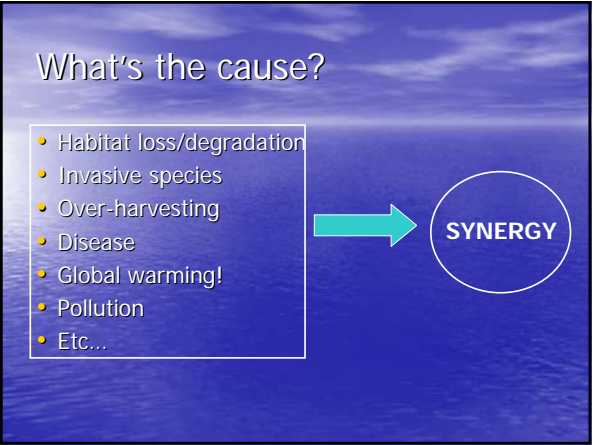


Threat diagnosis
What is...or could be the problem?

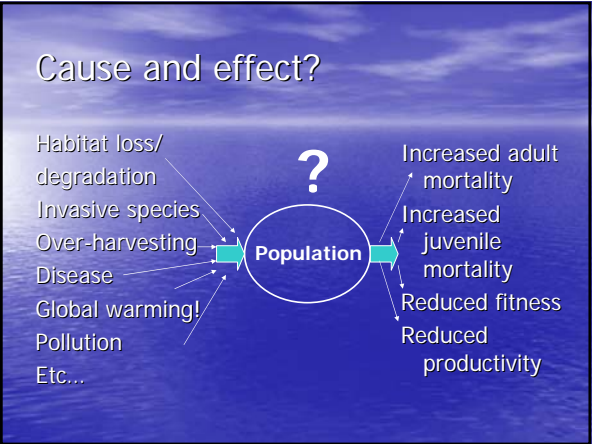
The use of causal flow diagrams in conservation problem analysis

- ### What's the cause?
- Habitat loss/degradation
 - Invasive species
 - Over-harvesting
 - Disease
 - Pollution
 - Global warming
 - Etc...

- ### What's the cause?
- Habitat loss/degradation
 - Invasive species
 - Over-harvesting
 - Disease
 - Global warming!
 - Pollution
 - Etc...



- ### ...and effect?
- Increased adult mortality
 - Increased juvenile mortality
 - Reduced fitness
 - Reduced productivity
 - ...a declining population!

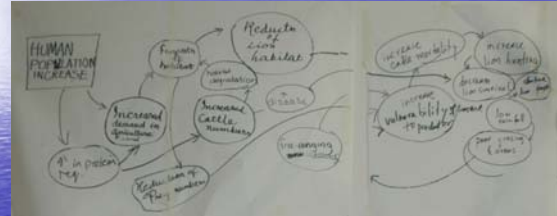


Fact or fiction?

- The species was common in the past; current estimates stand at 150 individuals. Therefore the species has declined significantly.
- Based on studies of all 20 wild pairs it is known that the species breeds year-round, with a clutch-size of one.
- The species is known to prefer scrub forest as this is the only place where the last 20 animals have been found.
- Based on a single observation it is known that the species spends most of its time resting
- "Extinction [of the Floreana mockingbird] on Floreana was probably caused by the introduction of black rat..."

(Last point = extract from IUCN red data sheet on *Nesomimus trifasciatus*)

Bringing it all together...



So, how does it work?

- Identify major factors (both known and assumed!)
- Identify how factors are linked
- Are links direct or inverse?
- Diagram links
- Analyse the diagram with all its links

Example...

- Understanding the decline of *Conolophus subcristatus* the Galapagos land iguana...

In 1835 Darwin noted that "...we could not for some time find a spot free from their burrows on which to pitch our single tent". Since then the introduction of non-native species including cats, dogs, rats and goats as well as direct predation by humans has led to their extinction on Santiago Island. Predation by native species, including hawks, herons and snakes does occur but only juvenile iguanas up to one year of age are vulnerable. However, cats can continue to kill iguanas up to 3-4 years of age and rats will both kill young iguanas and eat the eggs. Adult iguanas are also threatened by the goats that eat the plants on which they rely for food and for water during dry periods. Adult females have been known to travel up to 15km to find a suitable nest site and the nest site is guarded for several days after laying to prevent other females laying in the same spot. It can take the young up to a week to dig their way out of the nest after hatching 85-110 days later.

Example...

- What are the main factors?

In 1835 Darwin noted that "...we could not for some time find a spot free from their burrows on which to pitch our single tent". Since then the introduction of non-native species including cats, dogs, rats and goats as well as direct predation by humans has led to their extinction on Santiago Island. Predation by native species, including hawks, herons and snakes does occur but only juvenile iguanas up to one year of age are vulnerable. However, cats can continue to kill iguanas up to 3-4 years of age and rats will both kill young iguanas and eat the eggs. Adult iguanas are also threatened by the goats that eat the plants on which they rely for food and for water during dry periods. Adult females have been known to travel up to 15km to find a suitable nest site and the nest site is guarded for several days after laying to prevent other females laying in the same spot. It can take the young up to a week to dig their way out of the nest after hatching 85-110 days later.

Example...

- Which factors are linked?

Predation by cats → ...

Predation by rats → ...

etc...

Example...

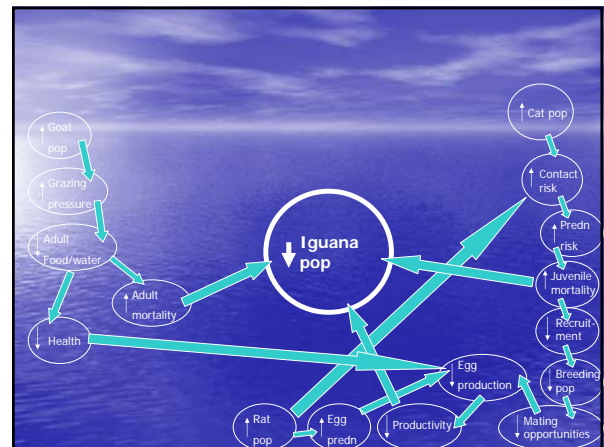
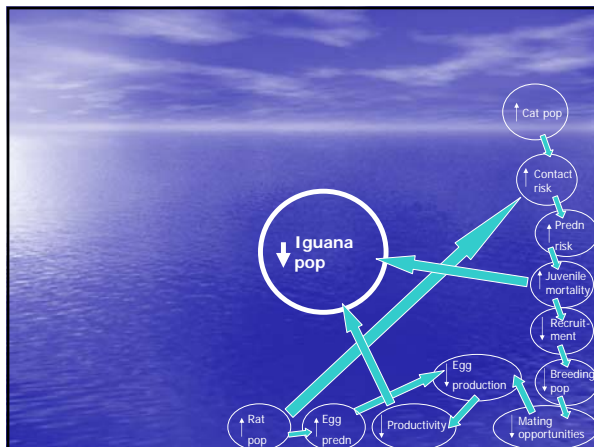
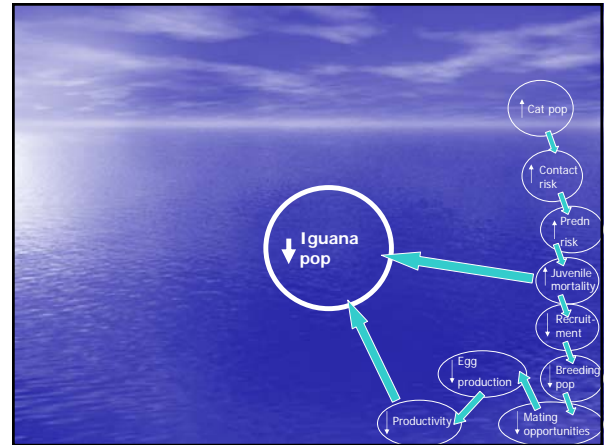
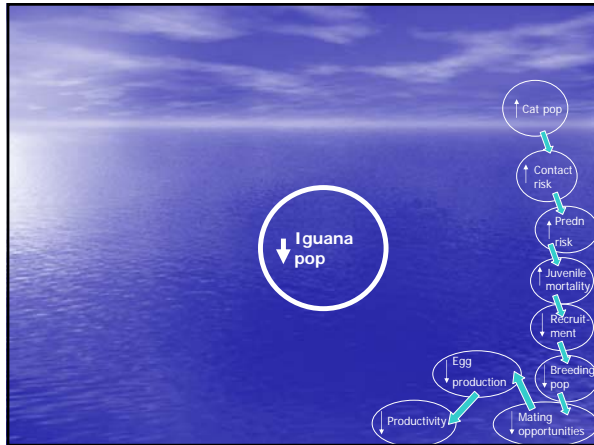
- Are links direct or inverse?

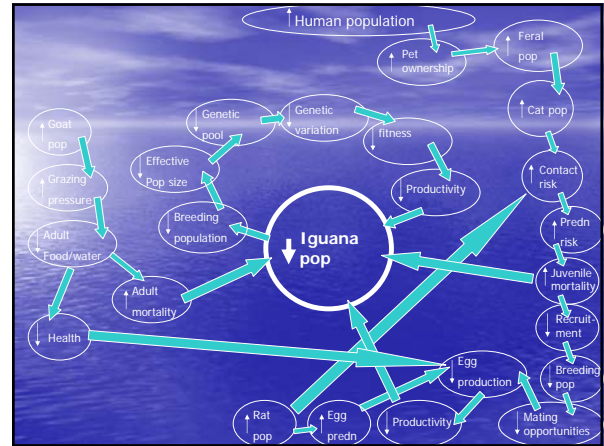
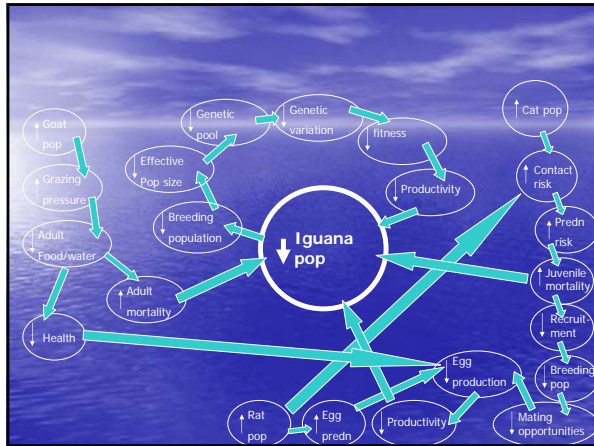
↑ Predation by cats → ↓ ...
 ↑ Predation by rats → ↓ ...
 etc...

Example...

- How do all the links fit together?

In 1835 Darwin noted that "...we could not for some time find a spot free from their burrows on which to pitch our single tent". Since then the introduction of non-native species including cats, dogs, rats and goats as well as direct predation by humans has led to their extinction on Santiago Island. Predation by native species, including hawks, herons and snakes does occur but only juvenile iguanas up to one year of age are vulnerable. However, cats can continue to kill iguanas up to 3-4 years of age and rats will both kill young iguanas and eat the eggs. Adult iguanas are also threatened by the goats that eat the plants on which they rely for food and for water during dry periods. Adult females have been known to travel up to 15km to find a suitable nest site and the nest site is guarded for several days after laying to prevent other females laying in the same spot. It can take the young up to a week to dig their way out of the nest after hatching 85-110 days later.





Understanding living systems

"The world is as delicate and as complicated as a spider's web. If you touch one thread you send shudders running through all the other threads. We are not just touching the web, we are tearing great holes in it."

A photograph of a man with grey hair and a beard, wearing a light-colored shirt, holding a large, intricate spider's web in his hand. The background is dark.

Over to you...

- Into your small groups
- Brainstorm what you know about your species (and your own ideas)
- Group the ideas into major factors (both known and assumed!)
- Identify how factors are linked
- Are links direct or inverse?
- Diagram links