Monsoon rainforests: frugivory and phenology

Because the monsoon rainforest movies are so rich with information, we have provided the following notes to help you make sure you have noticed the main points covered by Dr Bach.

Film 1 – Introduction to the monsoon rainforests of NT
- Monsoon rainforest occurs as small scattered patches
- Typically < 5ha in size; there are >15,000 patches documented
- Dr Jeremy Russell-Smith recognized 16 monsoon rainforest types, but the principal classification is between wet patches, which are associated with permanent water, and dry patches which occur inland or along the coast
- >17% of species in the monsoon rainforest produce fleshy fruits eaten by frugivores
- Threats to monsoon rainforests include fires, feral animals such as pigs, water extraction and clearing associated with general development.
- Because of increasing concerns about the threats to monsoonal rainforests the NT Government, with the support of Commonwealth funding, undertook a multidisciplinary study of monsoonal rainforests and the links between frugivorous bird and bats and the monsoonal rain forests.

Film 2 – Patterns of fruit production in the monsoon rainforests
- Dr Bach found strong seasonal patterns in fruit production in monsoon rainforest, with overall fruit production higher in the wet than in the dry season.
- There is also variability in spatial pattern of fruit production, so that not all patches fruit at the same time
- There is also variability between the fruit production of wet and dry patches, with wet patches typically producing much more fruit overall than dry patches.
- However the fruit of dry patches is available later than that of the wet patches, and is therefore important in the early dry season when less wet season patches are fruiting.
- Because of this variability in fruit production between forest types, as well as within forest types and among species, small patches can still be very important as a food resource at some time during the year.
• In addition to patches, there are also keystone species that are an.
• *Ficus virens* is an example of a keystone species. The fruiting of individual is aseasonal, and so are important during the dry season when the majority of other species are not fruiting.
• The palm *Carpentaria acuminata* is another important keystone species, which exhibits an aseasonal fruiting pattern.

**Film 3 – Resources use by Frugivores**
• Dr Owen Price resource use and movement patterns by frugivorous birds.
• He found that birds track fruit resources across rainforest patches, sometimes over long distances.
• This is important for plants because these birds disperse seed between patches and across patch boundaries.
• Dr Price found three patterns of use.
• The first group is *obligate frugivores*, which reply on fruit only and stay in the NT rainforest patches all year round. An example if the rose-crowned fruit dove.
• The second group (or guild) are *obligate frugivores* that migrate from the NT to PNG when resources are more scarce in the NT dry season. An example is the Torresian imperial pigeon.
• The third group are *facultative frugivores* which turn to other resources in the landscape during the dry season when fruit is scare. These other resources include nectar and insects in the melaleuca swamps or in the surrounding savanna woodland.
• Another important frugivore species if the black flying fox.
• Carol Palmer found in her study, that like birds, black flying foxes track resources across the landscape throughout the year, and can fly up to 60 km in one night.
• This means they are also important seed dispersers and connect patches within the landscape.

**Film 4 – Conservation implications**
• The strong interdependency between monsoon rainforest patches and frugivores has implications for conservation.
• It is not enough to reserve a sample of little patches.
• We need to look at the whole landscape to conserve the network and system to account for the interdependency of frugivores and the monsoon rainforest patches, and the surrounding communities (melaleuca swamps and savanna).
• Using the observed movement patterns of birds and bats Dr Price calculated that an area with a 50 km radius would need to be placed in a reserve to capture the whole rainforest and surrounding landscape required to sustain this system of frugivory.
• So this large area means that other landholders must become involved in conservation. They must be encouraged to preserve rainforest patches and linking habitat such as creek lines and isolated *Ficus virens* trees is we are to protect this important system.