

Life Forms (Raunkiaer's Classification)

A Danish ecologist, Christen Raunkiaer (1876-1960), proposed a classification of plants based on the position of these perennating organs in relation to the soil surface. This classification is known as Raunkiaer's Life Forms. The classification by Raunkiaer is as follows:
(The numbers at the side refer to the large numbers on the drawings)

1. Phanerophytes

A tall, woody or herbaceous perennial with resting buds more than 25cms above soil level, e.g. deciduous trees and shrubs.

2 & 3. Chamaephytes

Perennating buds or shoot apices are borne very close to the ground, or a small, woody herbaceous plant having resting buds **not** more than 25cms above soil level, e.g. rockrose, bilberry.

4. Hemicryptophytes

Plants with resting buds at or near the level of the soil, e.g. daisy.

5, 6, 7, 8, 9. Cryptophytes

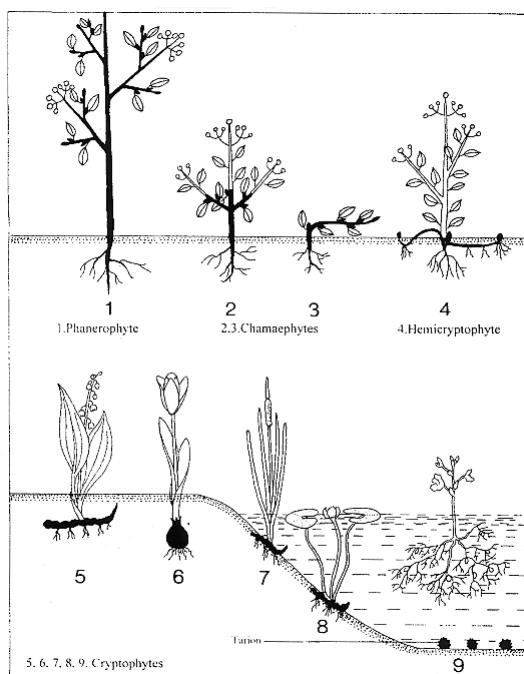
Plants with resting buds lying either beneath the surface of the ground as a rhizome, bulb, corm, etc., or a resting bud submerged under water.

Cryptophytes are sometimes divided up into one of the following:

- **Geophytes** resting in dry land, e.g. Crocus, Lily-of-the-Valley.
- **Helophytes** resting in marshy, lake or pond edges, e.g. Reed Mace.
- **Hydrophytes** resting by being submerged under water, e.g. Frogbit. Some over-winter as turions.

Note: Some aquatic plants develop special winter food storing buds, known as **Turions**. A turion is an underground bud or shoot which develops into an aerial stem; a winter bud, characteristic of many aquatic plants, that contains food material and becomes detached from the parent plant, either floating or resting at the bottom of the water until favourable conditions stimulate its development and growth into a new plant.

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C-S-R strategy theory

“ The external factors which limit the amount of living and dead plant material present in any habitat may be classified into two categories ”

Opening sentence from J P Grime's 1979 book
Plant Strategies and Vegetation Processes

3

Category 1: Stress

Phenomena which *restrict* plant production

e.g. shortages of light, water, mineral nutrients, or non-optimal temperature

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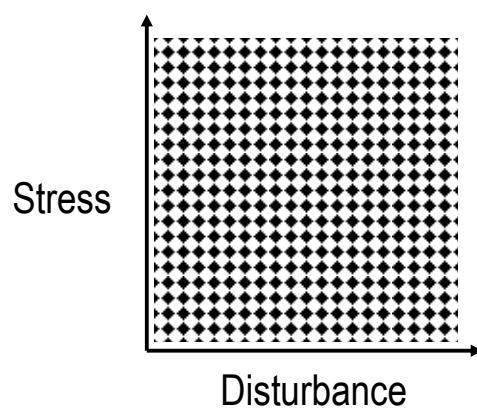
Category 2: Disturbance

Phenomena which *destroy* plant production

e.g. herbivory, pathogenicity, trampling, mowing, ploughing, wind damage, frost, droughting, soil erosion, burning

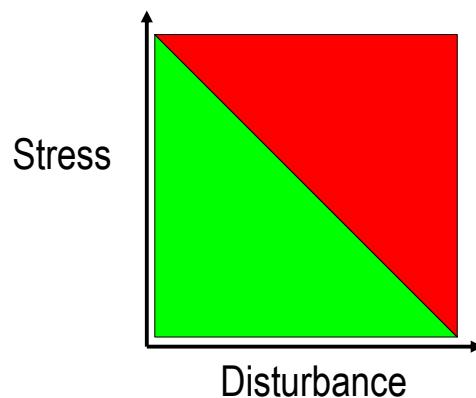
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Habitats may experience stress and disturbance to any degree and in any combination



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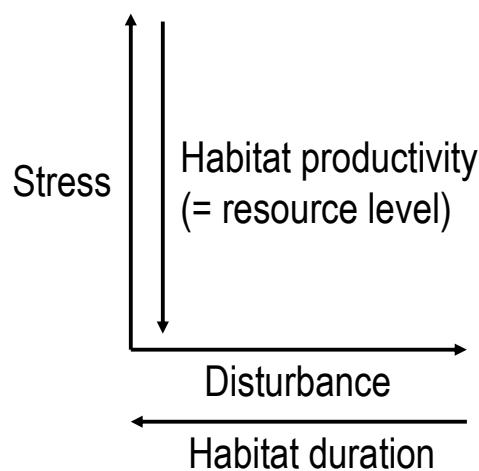
Low or moderate combinations of stress and disturbance can support vegetation ...



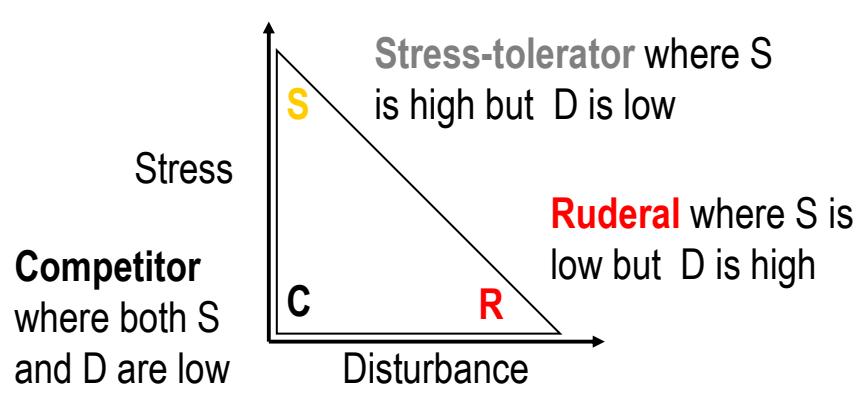
... but extreme combinations of stress and disturbance cannot

7

There are other ways of describing stress and disturbance

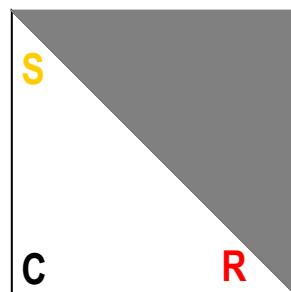


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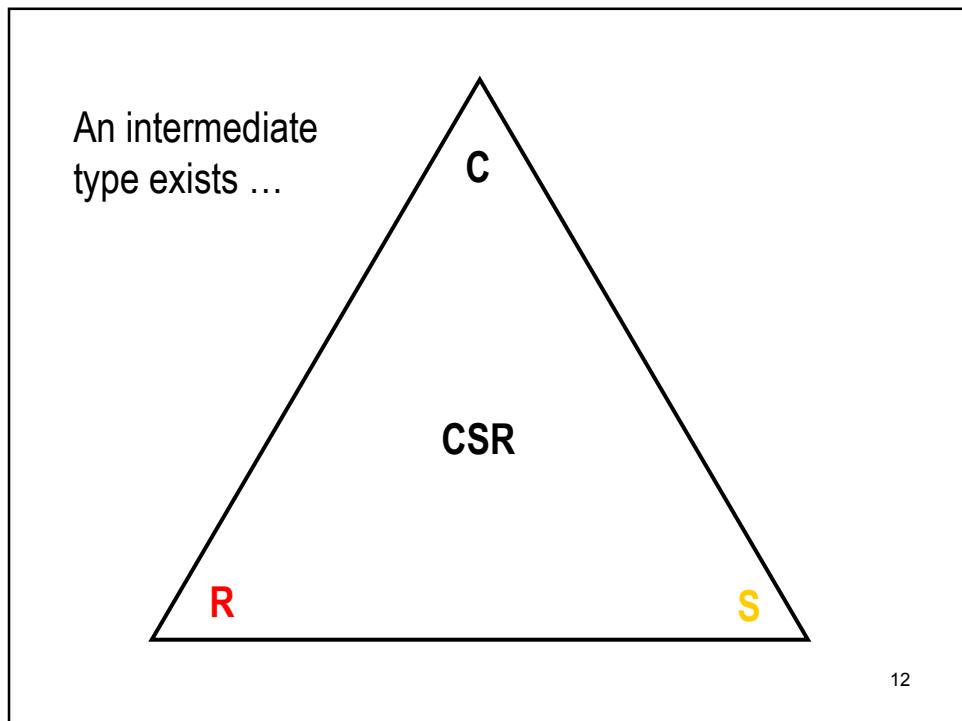
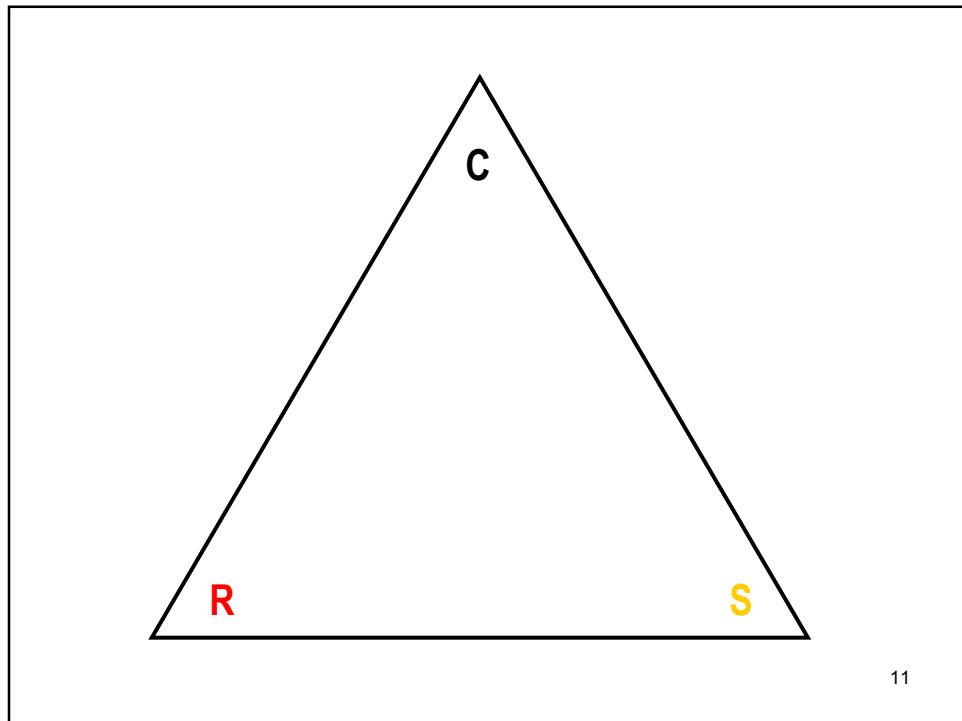


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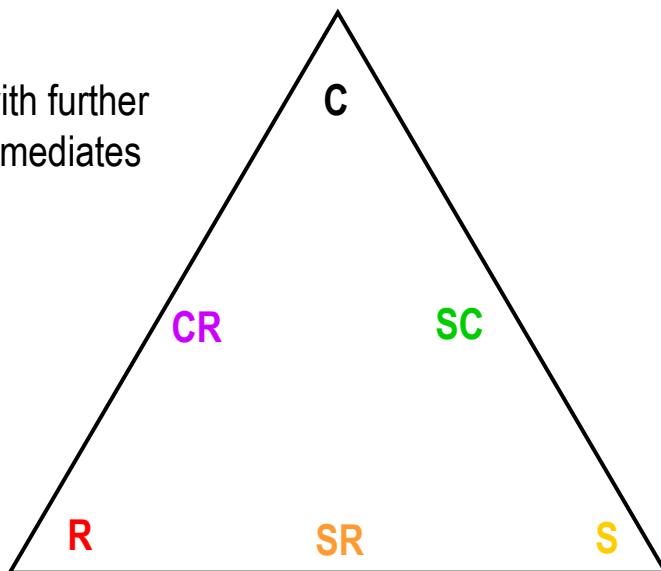
No plant strategies occur in the 'impossible domain'



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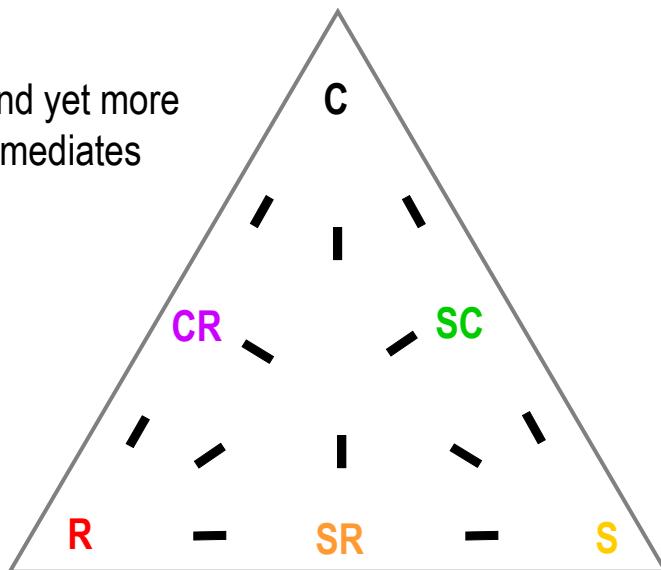


... with further
intermediates
here



13

... and yet more
intermediates
here



14

Combinations of plant attributes for **seven** C-S-R functional types

Functional type	Module size	Module longevity	Propensity to flowering
C	High	Low	Low
S	Low	High	Low
R	Low	Low	High
SC	Medium	Medium	Low
SR	Low	Medium	Medium
CR	Medium	Low	Medium
CSR	Medium	Medium	Medium