

Senita cactus - senita moth  
*A pollination-seed predator mutualism...*



*Lophocereus schottii*

egg

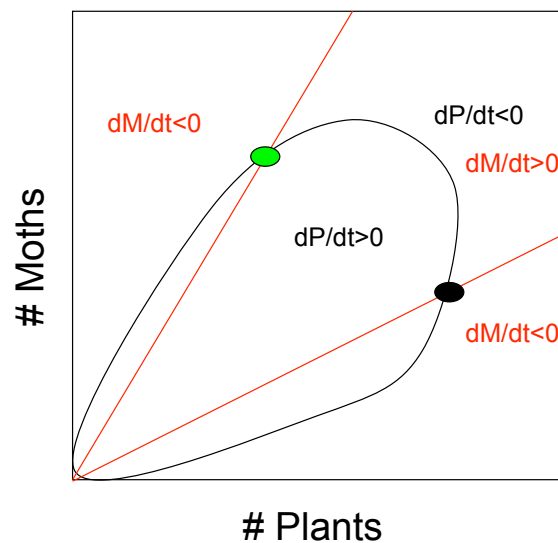


*Upiga virescens*

Holland and DeAngelis (2002) model of the  
*Lophocereus-Upiga* mutualism

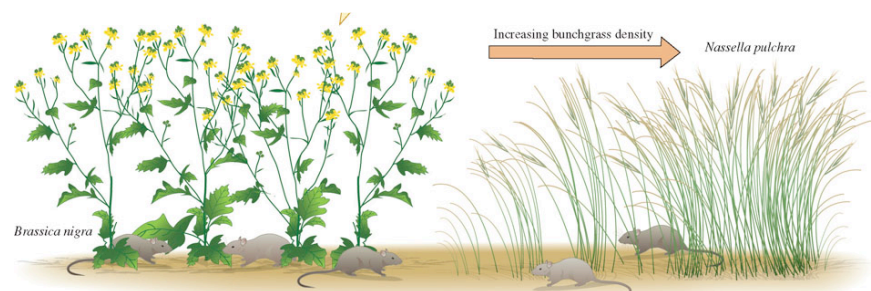


*Upiga virescens*

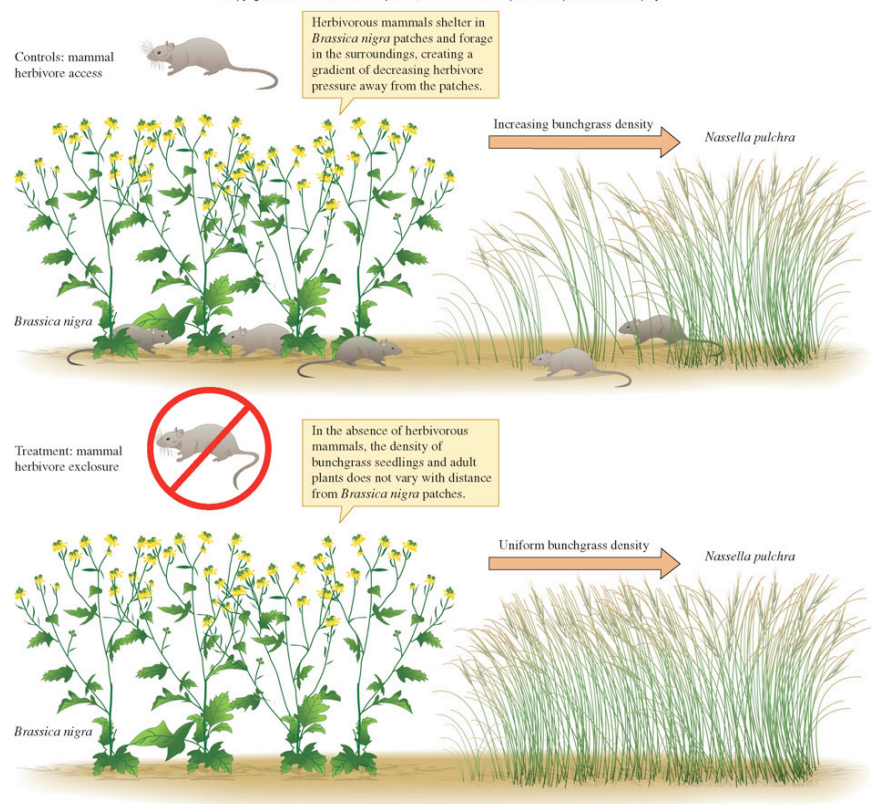


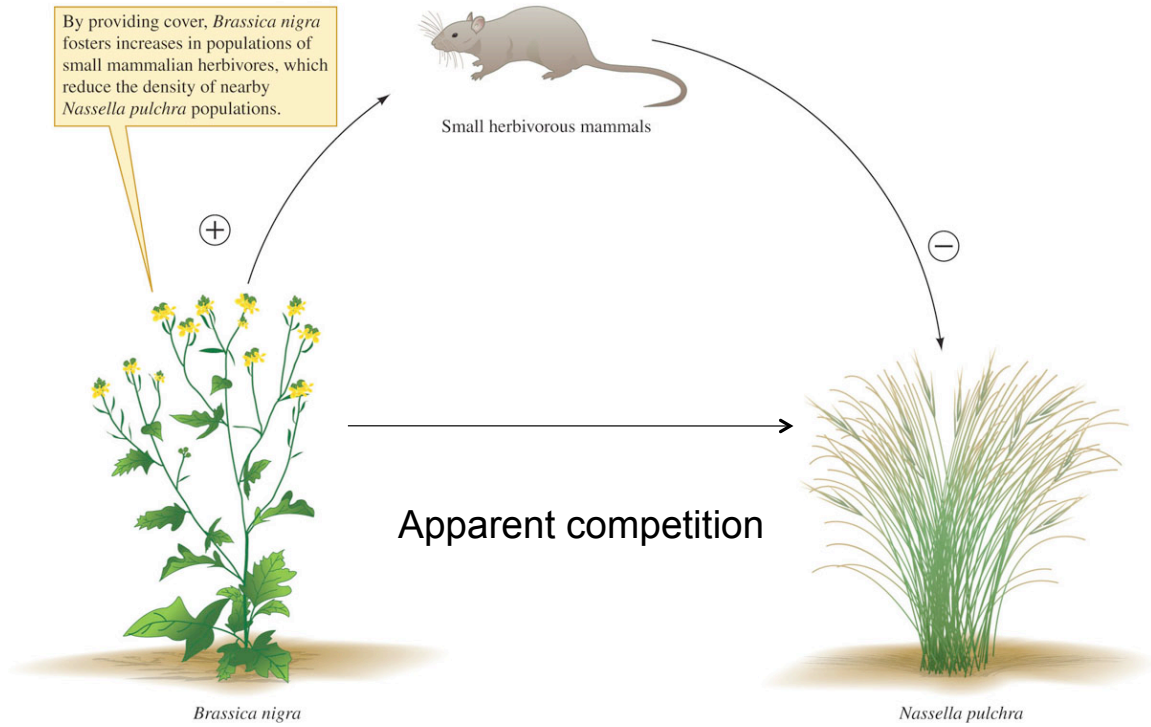
*Lophocereus schottii*

competition?



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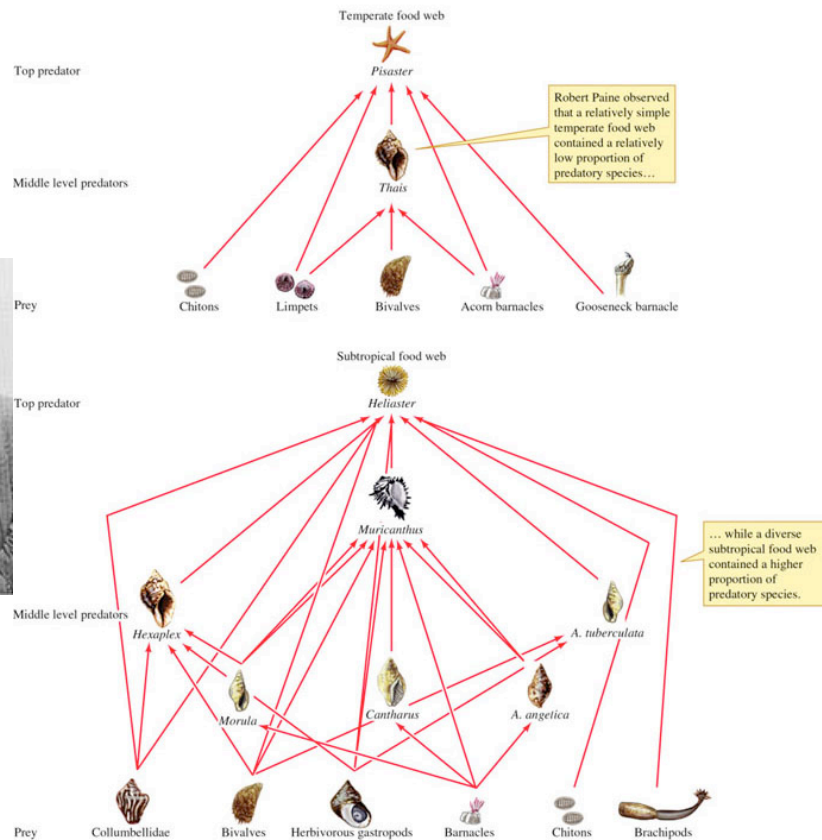


## Food webs

Paine 1966

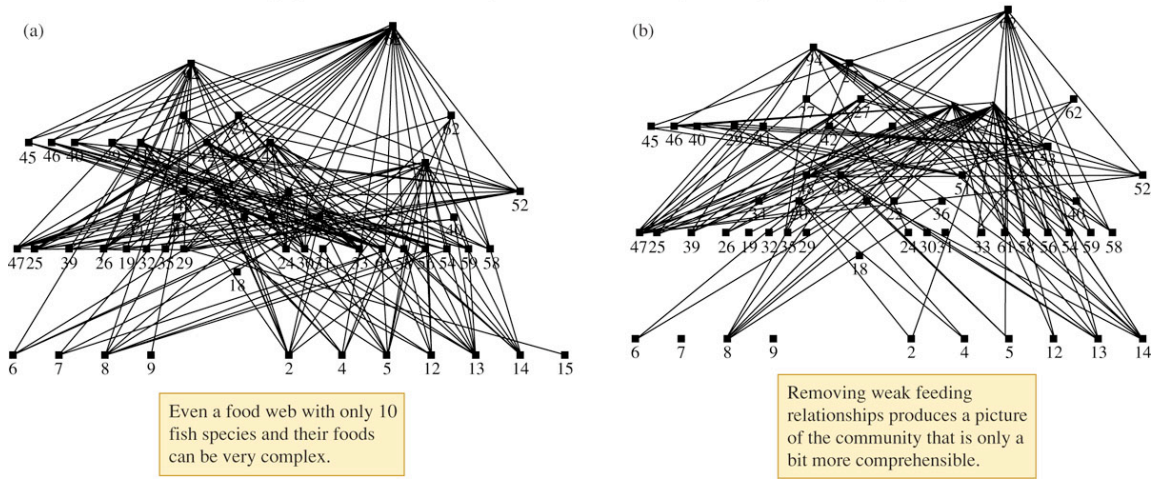


Charles Elton

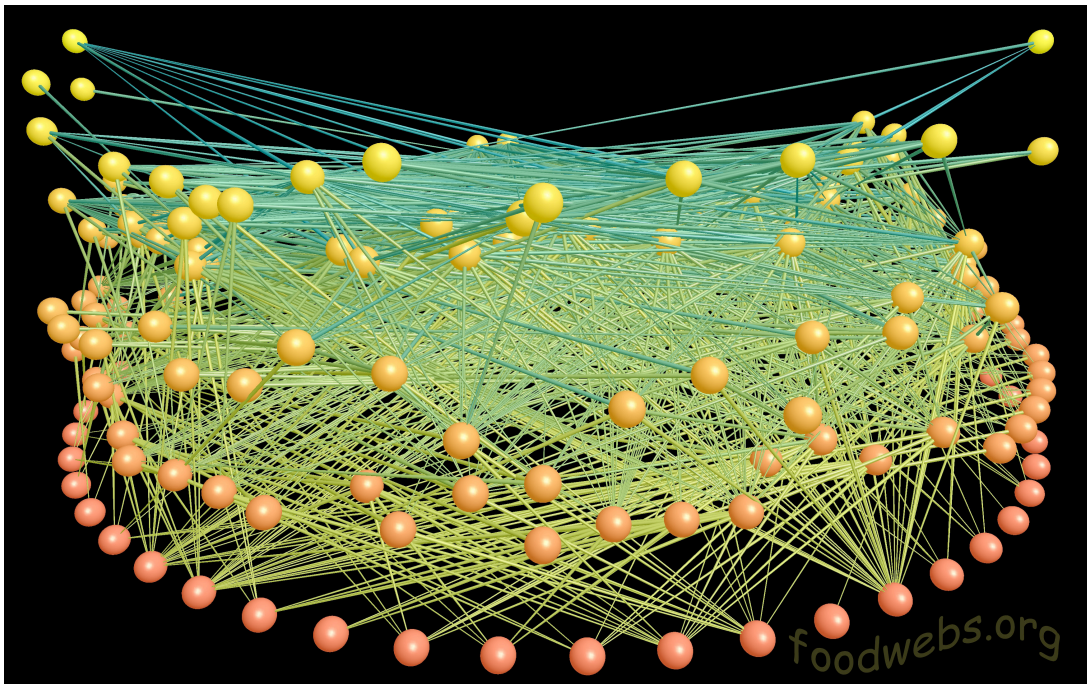




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## El Verde rainforest web - trophic (not taxonomic) species

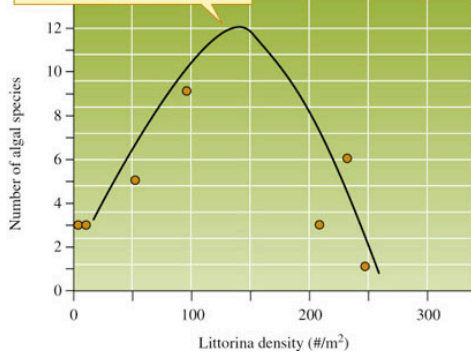


# “Keystone species” effect of trophic structure on species diversity

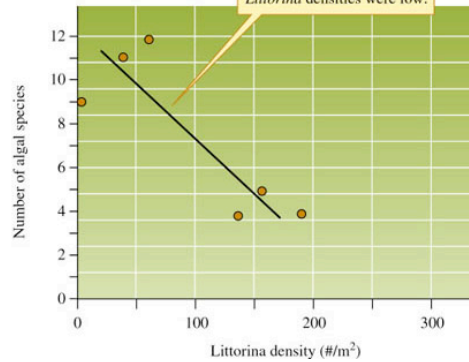
Lubchenco 1978



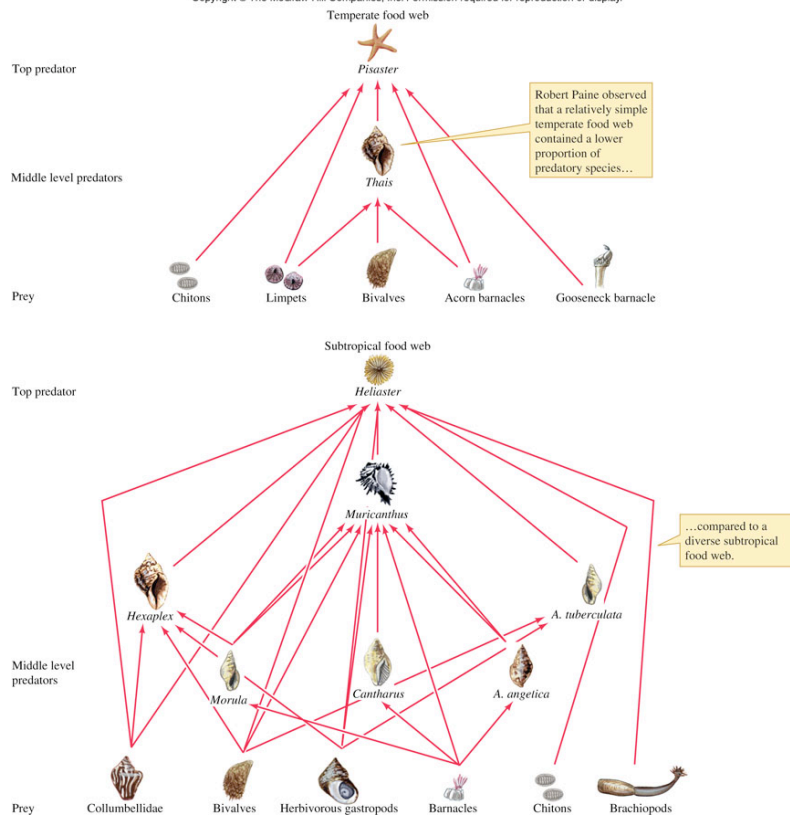
In tide pools algal species richness was highest at intermediate densities of *Littorina*.

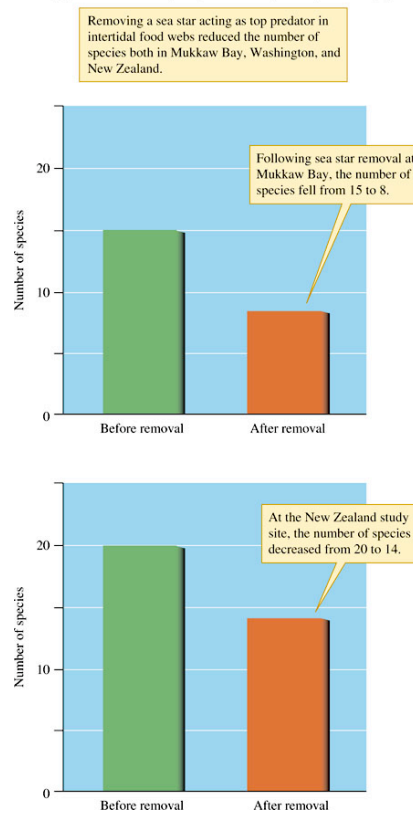


On emergent habitats, algal richness was highest where *Littorina* densities were low.

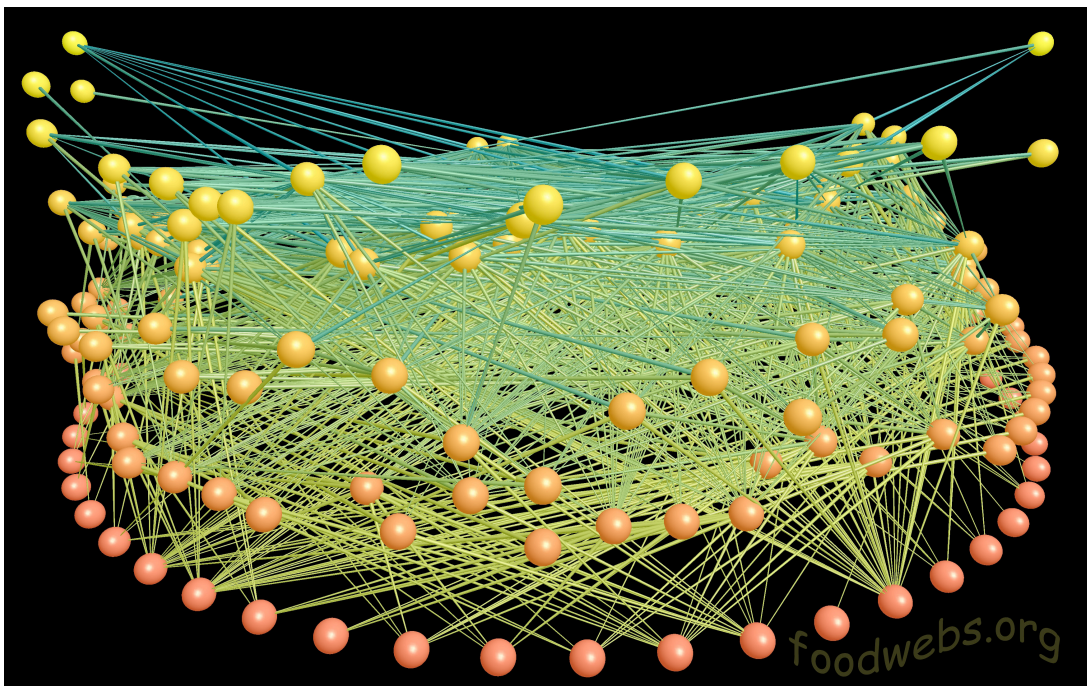


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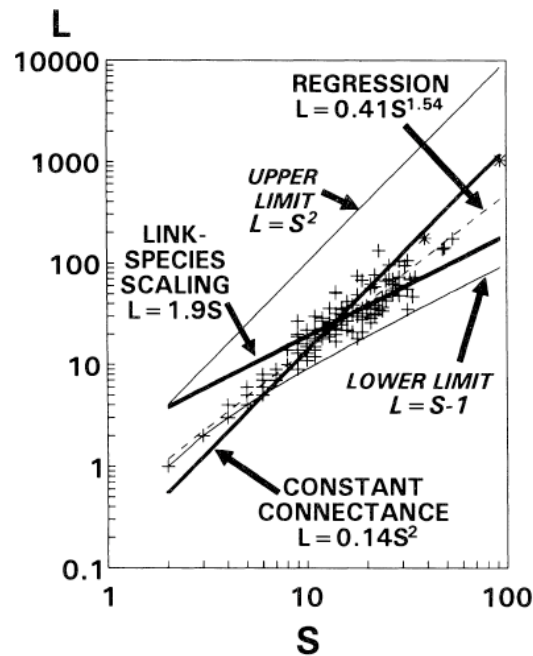
## El Verde rainforest web - trophic (not taxonomic) species





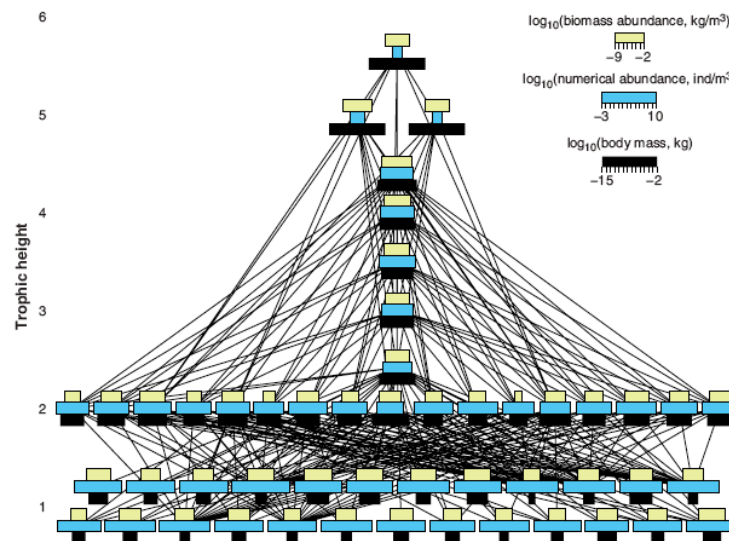
## Patterns of connectance in food webs (Martinez 1992)

### CONSTANT CONNECTANCE IN COMMUNITY FOOD WEBS



### More detailed, dynamical foodwebs

Jonsson, Cohen,  
Carpenter (2005)



The food web of Tuesday Lake, 1984. The width of the horizontal bars shows the body mass (log<sub>10</sub> kg), number (log<sub>10</sub> individuals per m<sup>3</sup>), and biomass (log<sub>10</sub> kg/m<sup>3</sup>), respectively, of each species. The vertical positions of the species show trophic height (20). Despite a major change in species composition, following a manipulation, this energetic setup of the food web remained roughly the same (19).