

Quick announcements:



- Study Guide posted
- Today: Community ecology
- Thurs: In-class Exercise #3
- Tues: Positive interactions & Disease
- Thurs: Exam #2

In-class Exercise 3

- ❑ Check for email re: downloading and signing up for SIMBIO (be in touch ASAP if you didn't get it)
- ❑ Follow the instructions to create an account and download the software for the in-class exercise BEFORE class on Thursday.
- ❑ Bring laptop to class Thursday if you have one, you can follow along with a peer if you don't
- ❑ BUT each student will need to have an individual account and finish the exercise individually to receive credit for the assignment.
- ❑ Let Rylee or Nico know if you do not have access to a computer ASAP (Do not email Wendy)

Communities of interacting species

How do we characterize them?

The group of species living together in a particular area



How do we define a community?

High desert community



(a)



Ponderosa pine forest

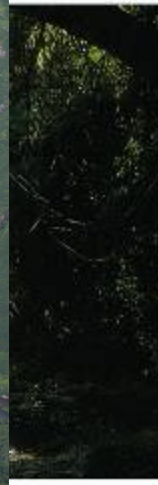
Glacial lake community



(c)



Deciduous forest



Riparian forest

How do we define a community?

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Deer Mouse
Peromyscus maniculatus



House Mouse
Mus musculus



Woodland Jumping Mouse
Napaeozapus insignis



Meadow Vole
Microtus pennsylvanicus



Southern Bog Lemming
Synaptomys cooperi



Northern Short-tailed Shrew
Blarina brevicauda



Hairy-tailed Mole
Parascalops breweri



Assemblages: particular taxonomic groups within a community

How do we define a community?

6

Evolved, organized interdependent ecological unit (boundaries discrete/closed)

Holistic (“superorganism”)

eg. social
spider webs



How do we define a community?

7

Evolved, organized interdependent ecological unit (boundaries discrete/closed)

Holistic (“superorganism”)

Coincident group of independent species that occur in the same place, who can tolerate the local physical and biological conditions (boundaries subjective/open)

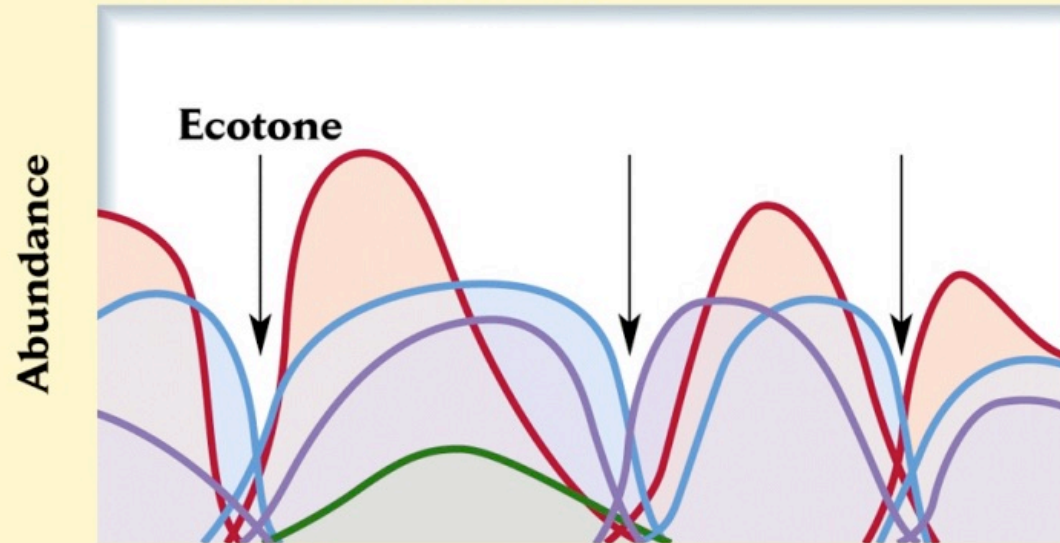
Individualistic

How would you study or test whether a community was either?

Ecotones are areas where environmental gradients are steep, and thus, species composition changes abruptly.

Think about what we mean by steep and shallow environmental gradients. Does human perception matter?

(a) Closed communities (holistic)



(b) Open communities (individualistic)



Environmental gradient

Closed community?

How would you describe the **ecotone** here?



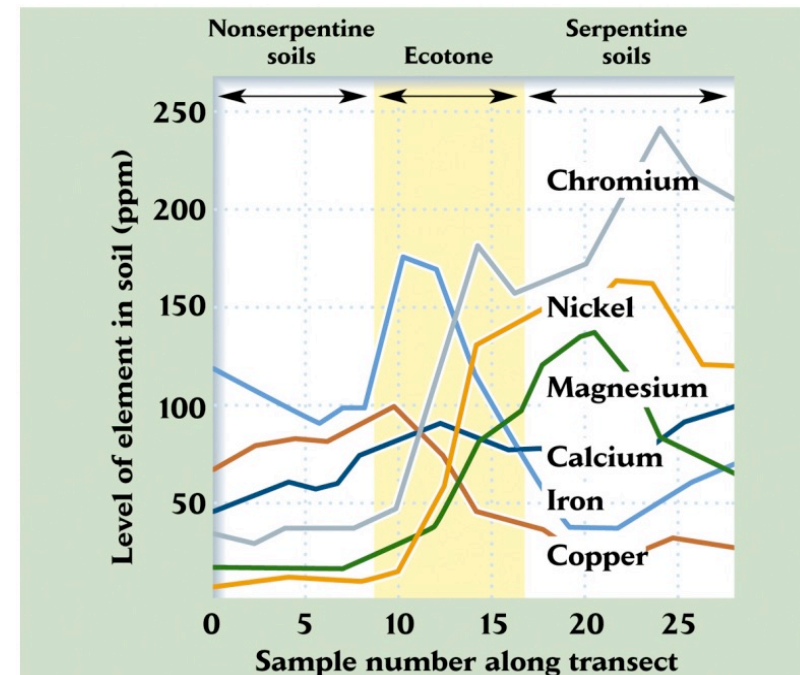
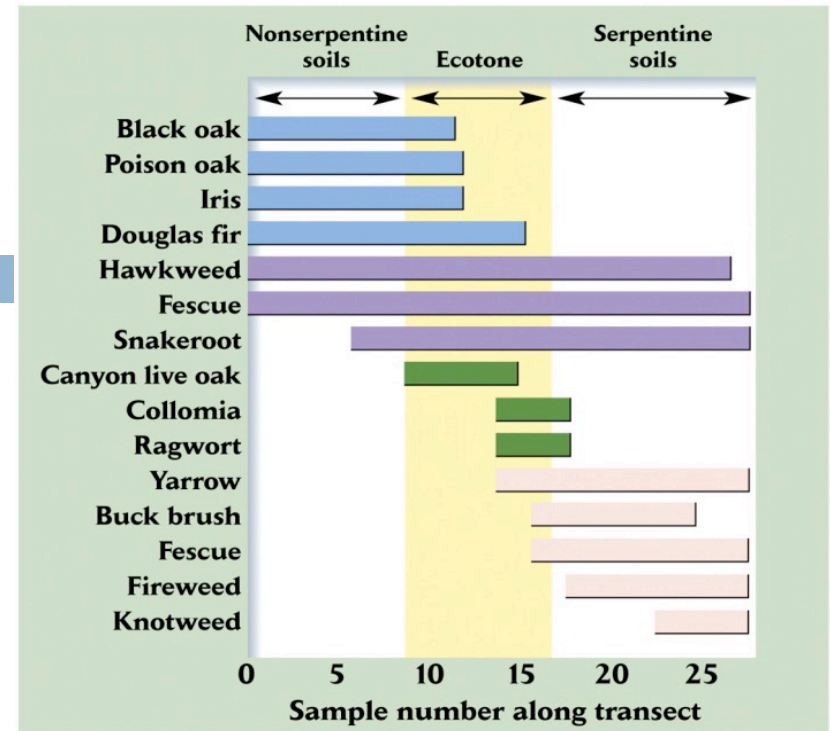
Open community



Ecotones can also be environmental gradients we can't see!



Open vs. closed dichotomy is too simplified, a **continuum** is more often what we observe



Food webs as an alternative way to characterize communities

- Emphasize trophic and interaction connections among species in a community

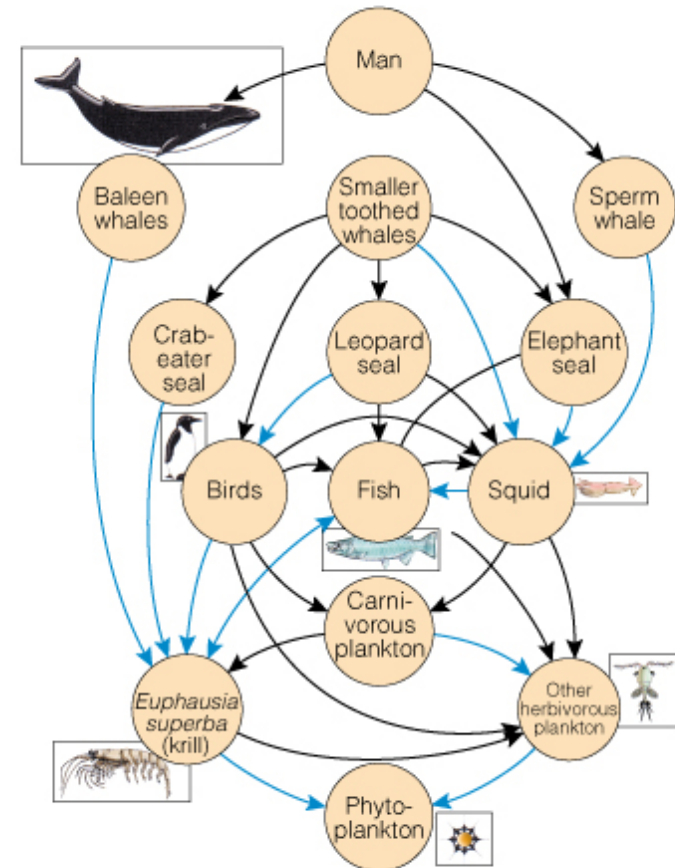
Functional groups

Descriptions of the feeding role of each species

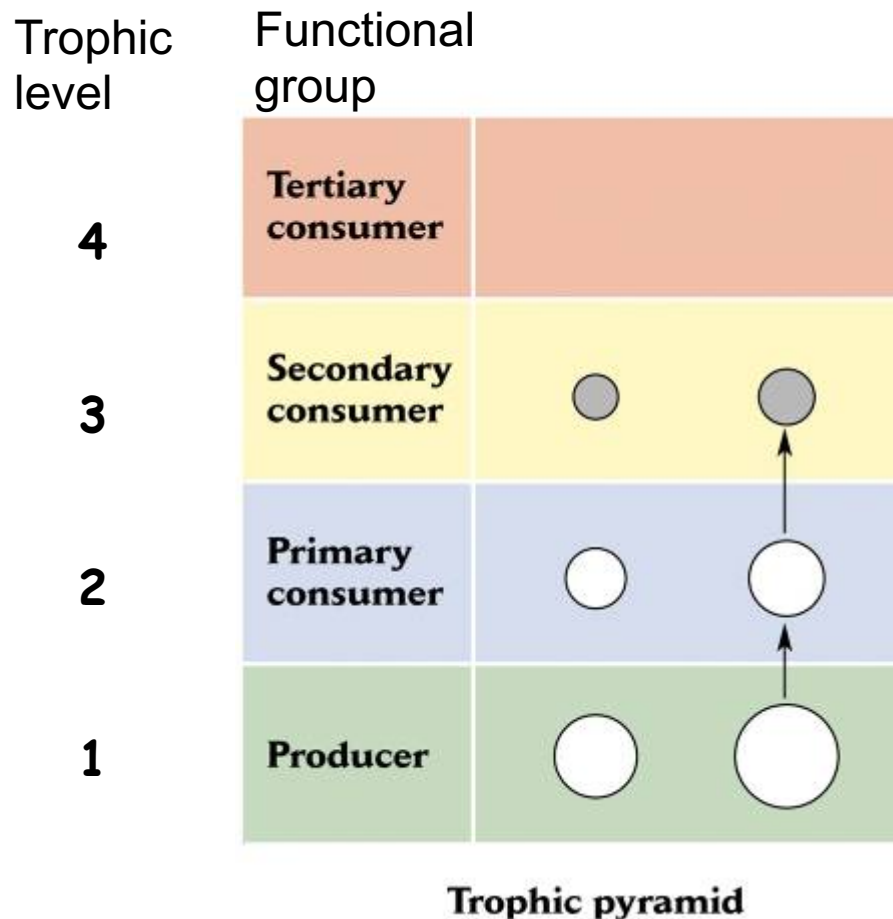
(producers, 1st 2nd 3rd consumers)

Trophic levels

Tend to be numbered levels from producers (1) up



Simplified food web (food chain)



*Arrow convention

Types of food webs

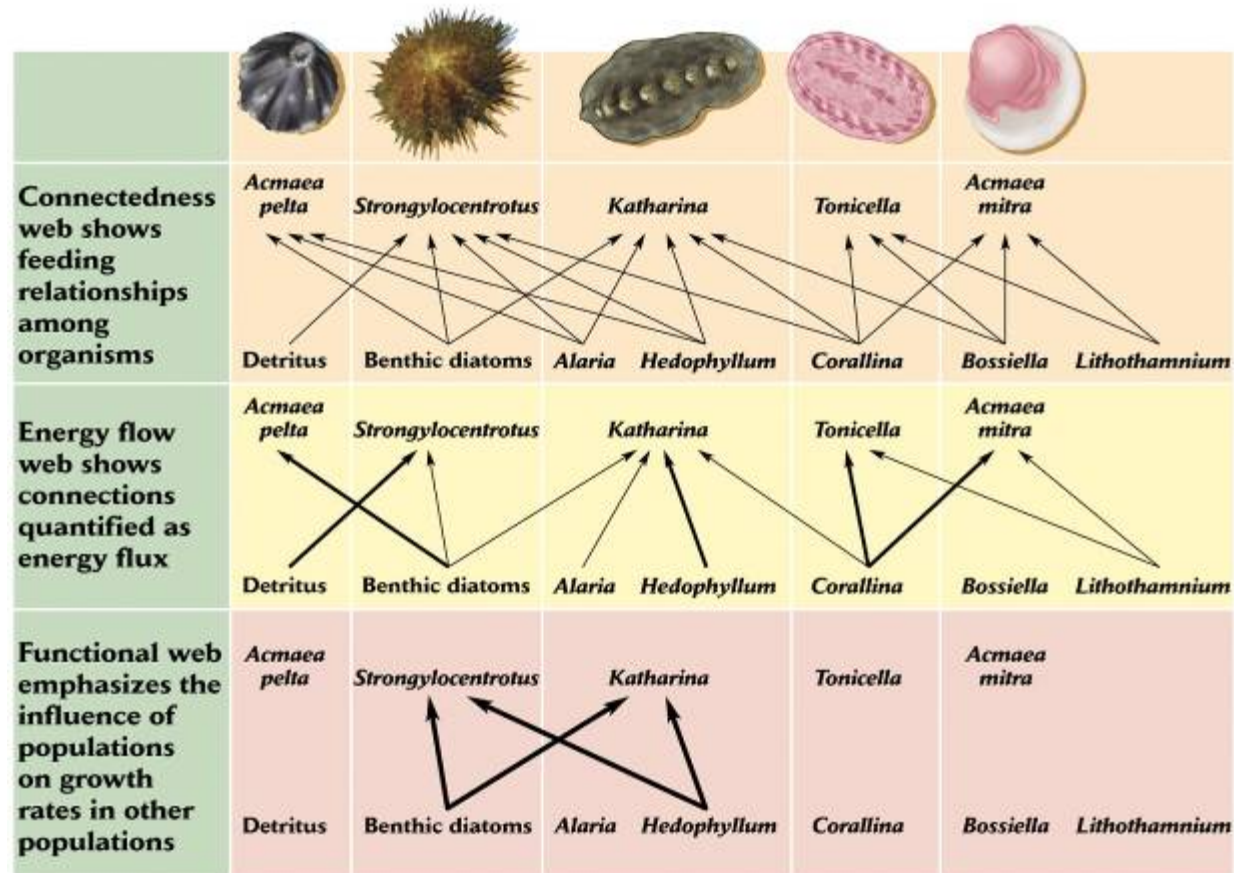
What study/expt's would you do to make any of these food webs?

1. Connectedness

2. Energy flow

Unit of
energy/unit time
eg. g or KJ/time

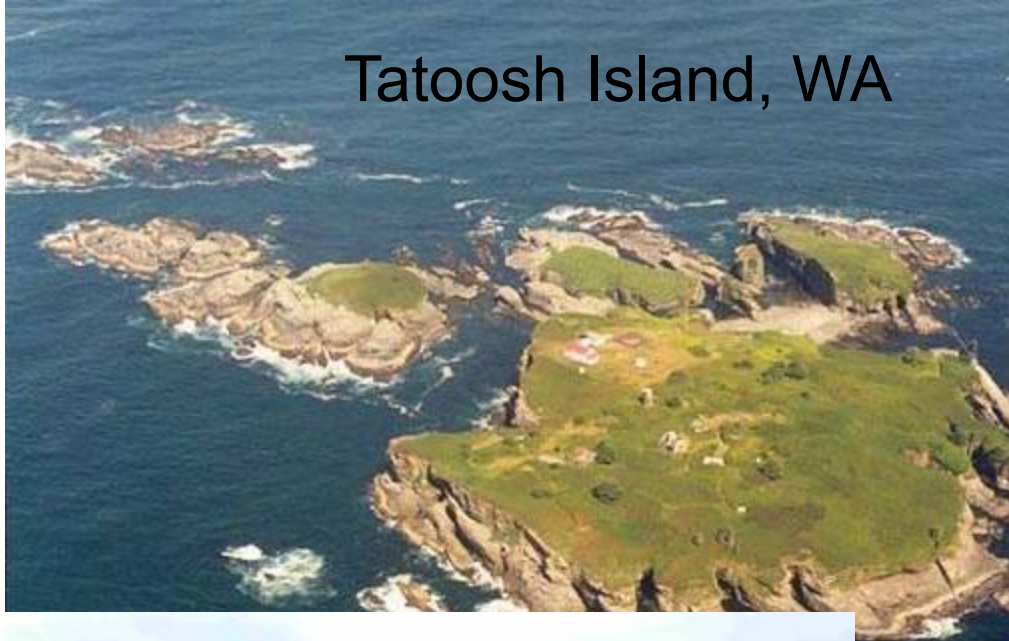
3. Functional or interaction



Why is there no arrows for the other spp in fxnl food webs?

*Arrow convention

Tatoosh Island, WA



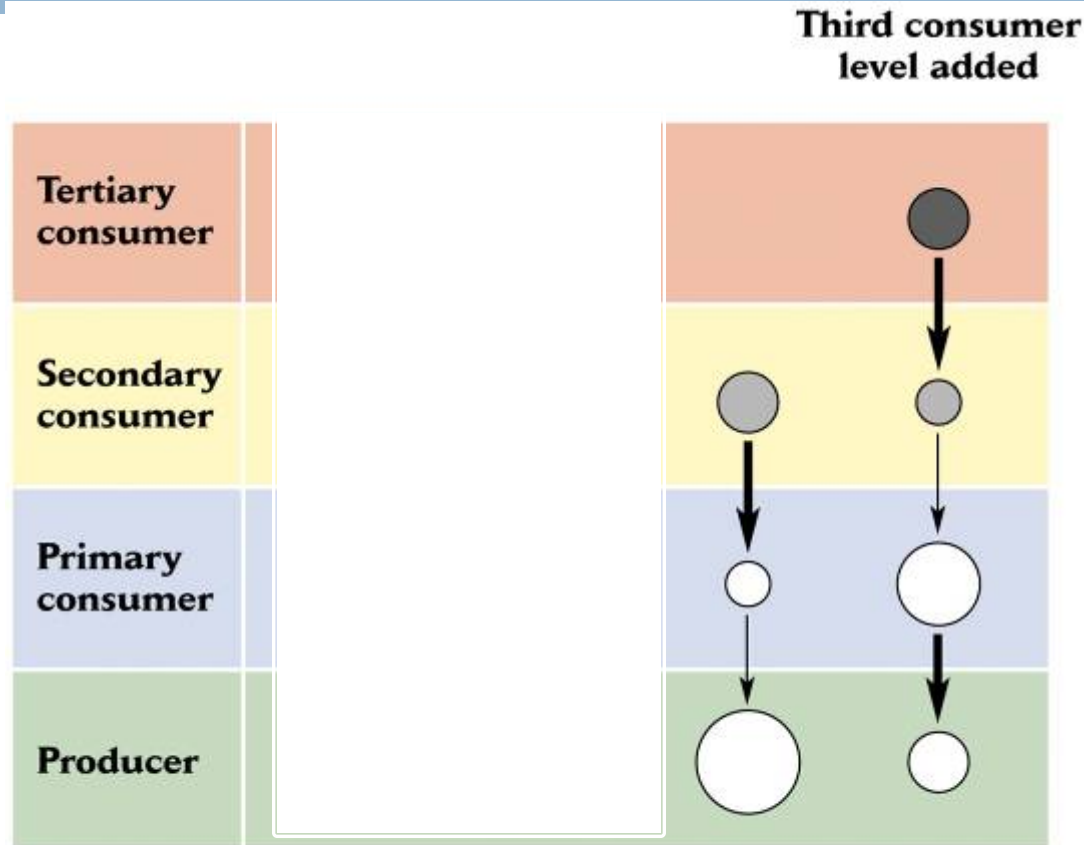
Bob Paine



Pisaster

Trophic cascades

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Which one has more primary production?
What are the direct and indirect effects?

Trophic cascades

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Density mediated indirect effect: densities of intermediate species are changed

eg. Lynx reduce pop'n size of hare

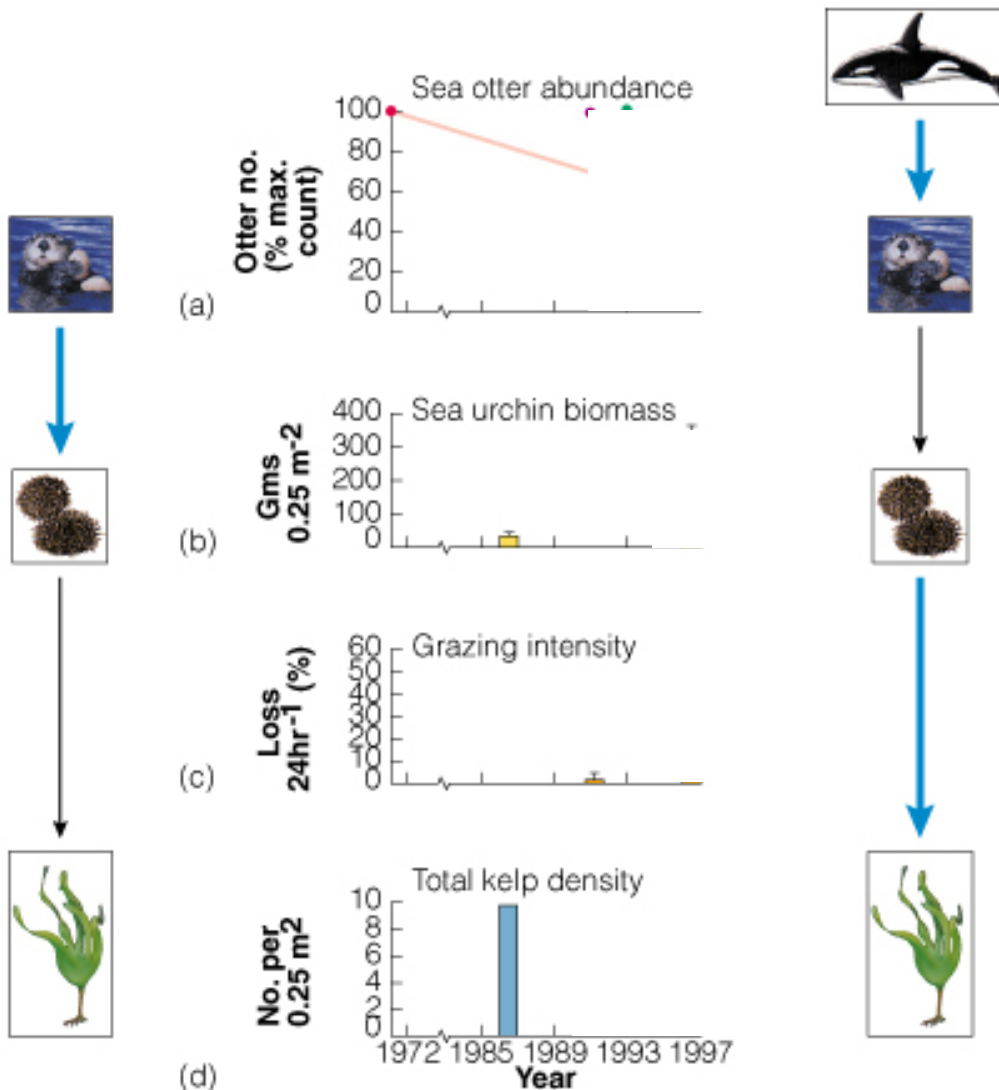
Trait mediated indirect effect: traits of intermediate species are changed

eg. Predators that cause prey to change behavior
-presence of spiders reduces grasshopper foraging, increase in primary production

Maintenance of kelp forests by trophic cascade

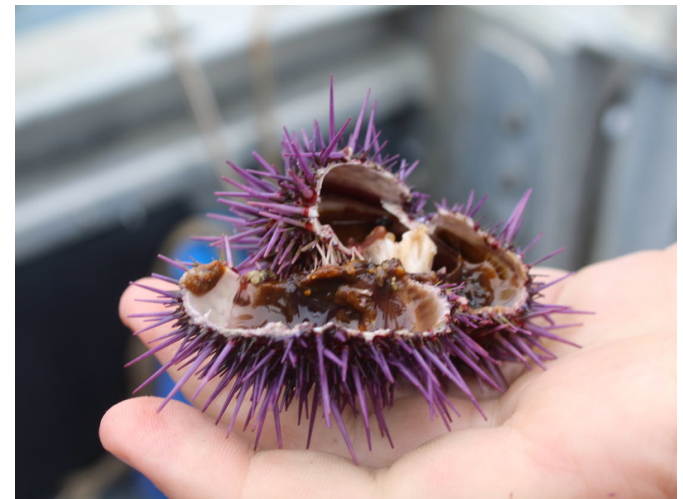
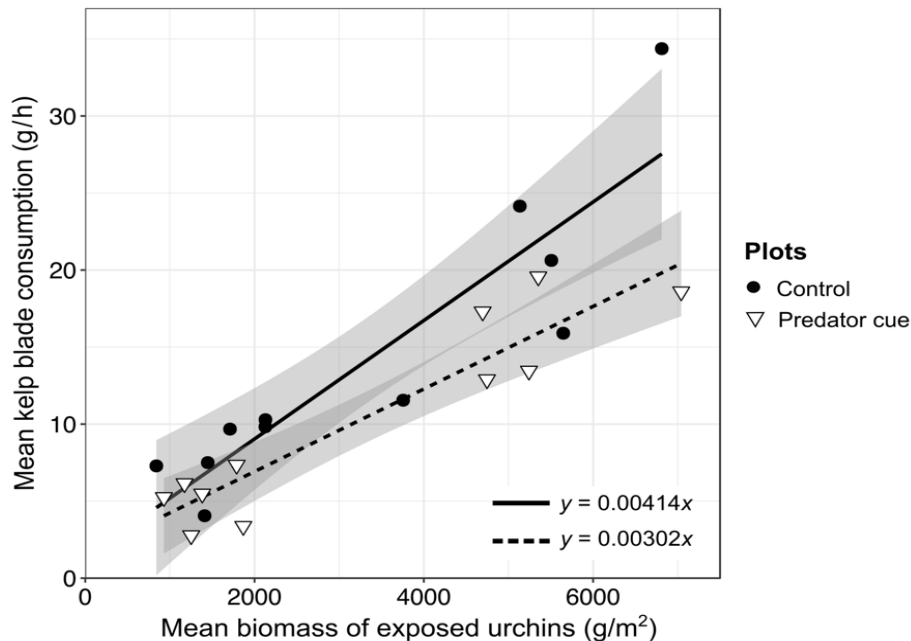
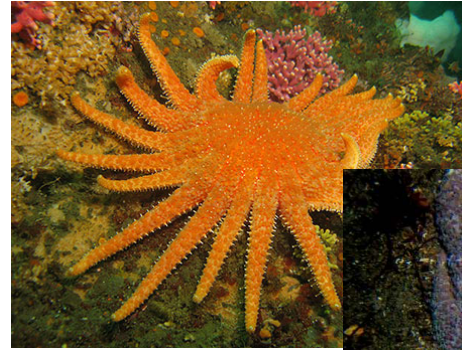
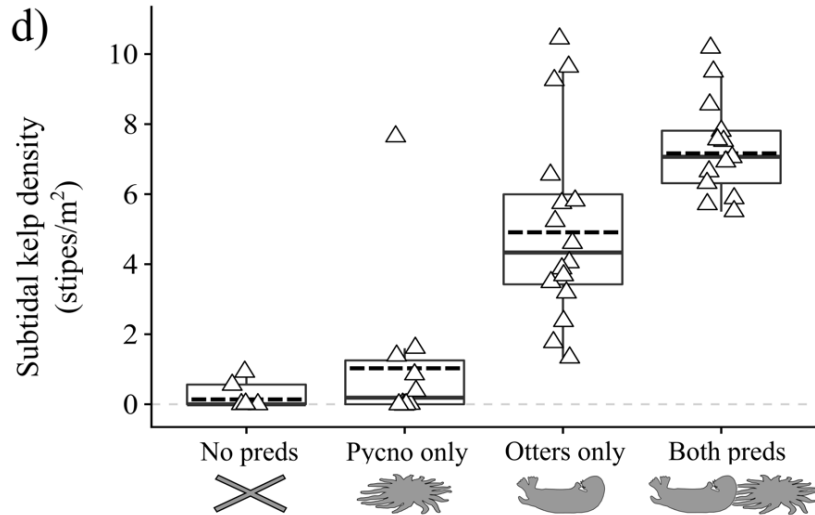


Maintenance of kelp forests by trophic cascade



Density or
trait mediated
indirect
effects?

Maintenance of kelp forests by trophic cascade





A bar chart showing Bullfrog survival (%) on the y-axis (0 to 70) for two conditions of Aeshnids: Present (black bar) and Absent (white bar). The survival rate is 20% when Aeshnids are Present and 61% when Aeshnids are Absent. Error bars are shown for both bars.

Aeshnids	Bullfrog survival (%)
Present	20
Absent	61

