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# Ekologi Populasi

## Bagian 1: Struktur populasi

Siti Nurleily Marliana





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SEJARAH KEHIDUPAN

# KONSEP DAN DEFINISI POPULASI





# POPULASI

Sekelompok organisme dari suatu spesies yang menempati wilayah tertentu.

Individu-individu suatu populasi:

- Menempati area yang sama;
- Bergantung pada sumber daya yang sama;
- Dipengaruhi oleh kondisi lingkungan yang sama.

# EKOLOGI POPULASI

Mempelajari populasi dalam kaitannya dengan lingkungan terhadap karakteristik populasi.

- Perubahan ukuran dan komposisi populasi.
- Penyebab ekologis fluktuasi populasi.



# DEFINISI ISTILAH

## VARIABEL

*-vary+able-*

- ❖ “Mempunyai kecenderungan untuk berubah”.
- ❖ Faktor-faktor yang dapat/cenderung mengalami perubahan.

## DINAMIKA

- ❖ “Dicirikan dengan perubahan atau progress yang berkelanjutan”.
- ❖ Perubahan-perubahan yang mencirikan suatu sistem.

# STRUKTUR POPULASI



# PEMBENTUK STRUKTUR POPULASI

Merupakan konsekuensi dari cara organisme berinteraksi dengan lingkungannya, dengan organisme lain, dan pengaruh interaksi tersebut terhadap evolusi organisme.

Pemahamannya penting untuk membantu dalam pembuatan keputusan yang berkaitan dengan manajemen alam dan konservasi organisme.



# KARAKTERISTIK TERPENTING

- 01 Ukuran
- 02 Densitas
- 03 Pola dispersi
- 04 Struktur umur
- 05 Struktur spasial
- 06 Rasio seks
- 07 Variabilitas



## 01 UKURAN POPULASI

Cacah individu anggota suatu populasi pada waktu tertentu (“ $N$ ”).

Seringkali juga disebut kelimpahan (*abundance*).



## 02 ■ DENSITAS POPULASI

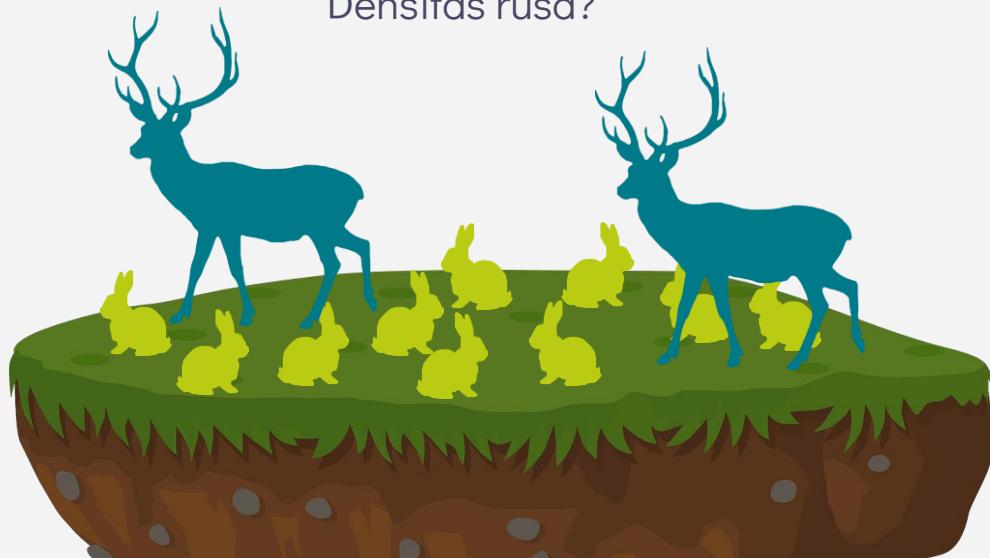
Cacah individu populasi per satuan luas/volume.

Cara pengukuran:

- Sensus
- Sampling

Seringkali lebih berpengaruh daripada kelimpahan.

# PERHITUNGAN KELIMPAHAN & DENSITAS POPULASI



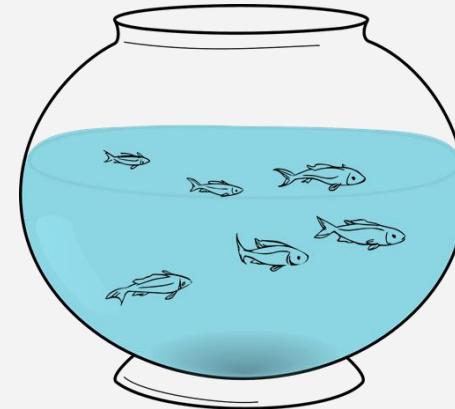
10 ekor kelinci

2 ekor rusa

1000 m<sup>2</sup> Habitat

Densitas kelinci?

Densitas rusa?



6 ekor ikan platy

4 L air

Densitas platy?

## 03 ■ POLA DISPERSI

Pola penjarakan antar individu dalam populasi.

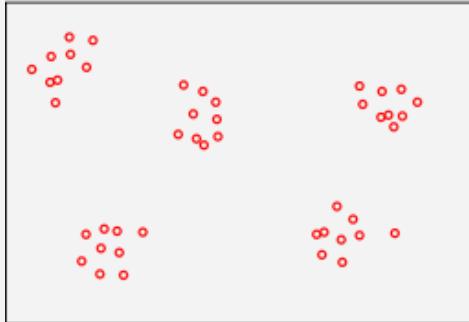
Berguna untuk melepaskan diri dari tekanan kompetisi.

Dipengaruhi faktor lingkungan & sosial.

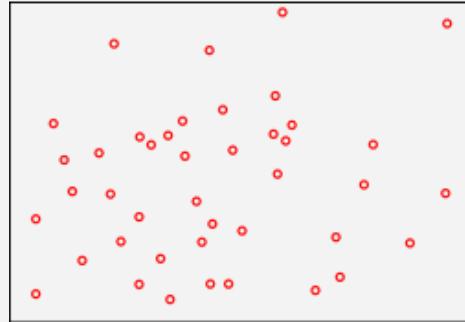
Ada tiga macam:

- clumped (menggerombol)
- uniform/regular/even (seragam)
- random (acak)

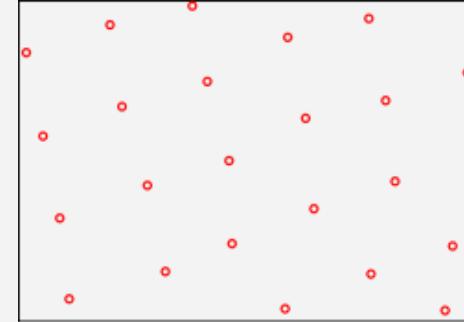
# JENIS-JENIS POLA DISPERSI



CLUMPED



RANDOM



UNIFORM



# POLA DISPERSI **CLUMPED** (MENGEROMBOL)

Paling sering ditemukan di alam.

Penyebab: sumber daya atau perilaku

- Bagian habitat yang kondisinya lebih cocok daripada bagian yang lain.
- Biji jatuh di dekat induknya, atau hanya berkecambah di lingkungan tertentu.
  - Alasan keamanan atau kelompok sosial.



## POLA DISPERSI **RANDOM** (ACAK)

Jarak antar individu tidak dipengaruhi oleh individu yang lain.

Tidak ada ketertarikan atau penolakan antar individu.

- Tidak umum ditemukan di alam.

Spesies pohon hewan tertentu dapat terdistribusi random.

- Di area dengan habitat yang sesuai.
- Dapat disebabkan oleh cara dispersal.



Dandelion



Oyster

# POLA DISPERSI **UNIFORM** (SERAGAM/TERATUR)

Individu tersebar dengan jarak lebih teratur.

Karena interaksi antar individu dalam populasi di habitat relatif homogen.

- ❖ Kompetisi
- ❖ Alelopati
- ❖ Teritorialitas
- ❖ Intervensi manusia



Penguins



Creosote bush



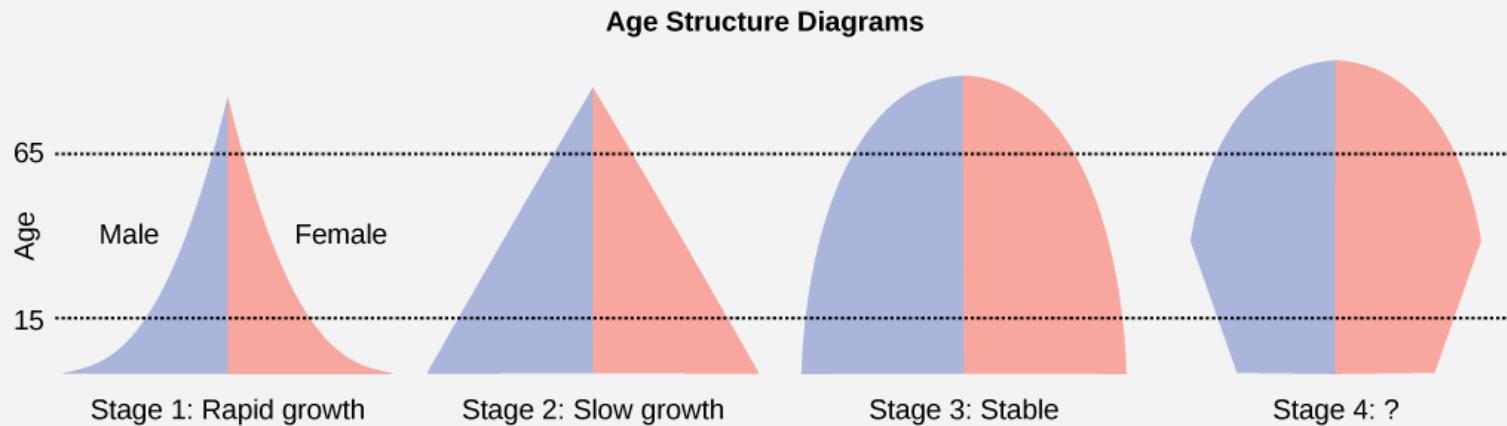
## 04 ■ STRUKTUR UMUR

Distribusi individu suatu populasi pada berbagai kelompok umur.

Parameter yang berkaitan dengan struktur umur:

- Fekunditas (*birth rate*).
  - Waktu generasi.
- Laju kematian (*death rate*).

# DIAGRAM STRUKTUR UMUR

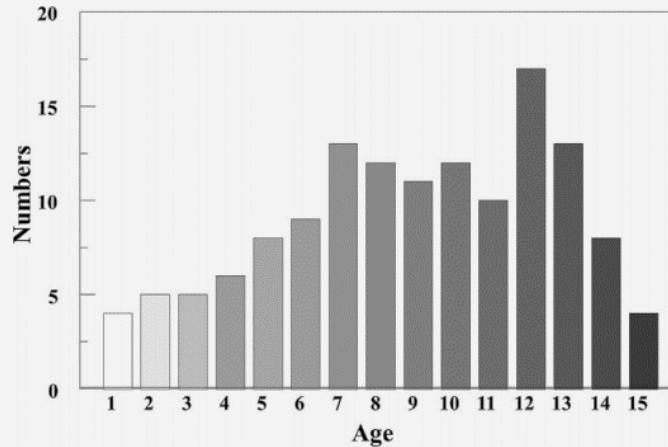


Struktur umur dapat mempengaruhi dinamika populasi, karena menyebabkan variasi atas berbagai macam variabel populasinya.



# DAMPAK PREDASI PADA STRUKTUR UMUR

Contoh kasus populasi elk di Amerika Utara

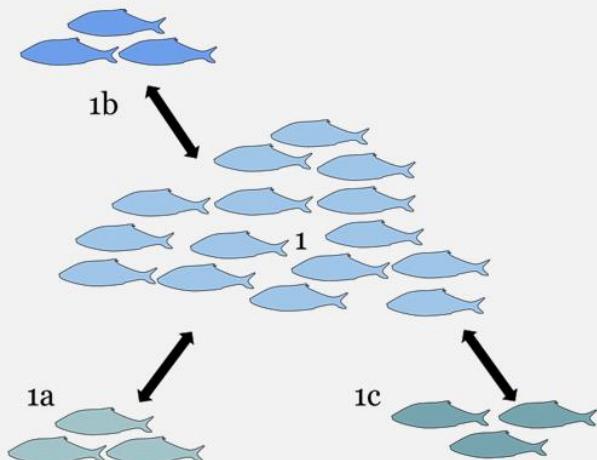


STRUKTUR POPULASIA

Struktur umur populasi elk dengan tingkat pemangsaan sangat tinggi pada anak baru lahir.

# 05 STRUKTUR SPASIAL

Organisme di alam terdistribusi dalam pola spasial tertentu.



Penyebab:

- Input energi
- Disturbansi,
- interaksi spesies

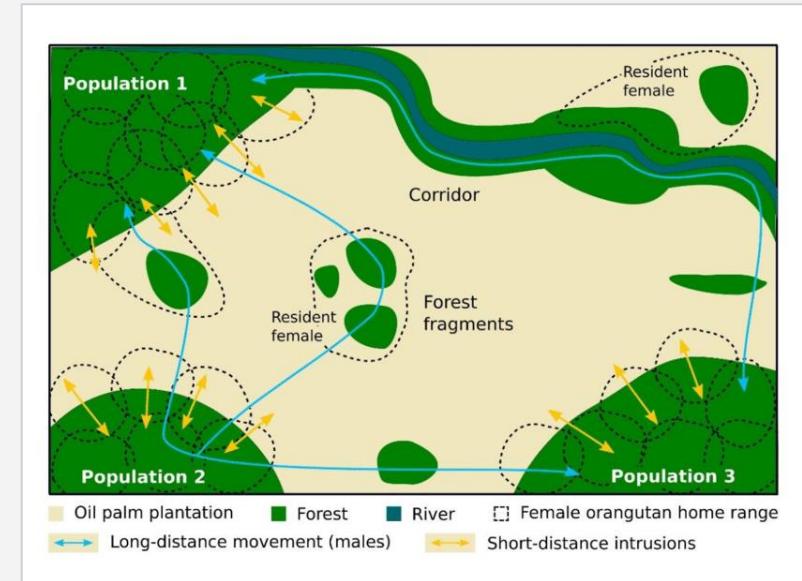
Distribusi spasial suatu spesies dipengaruhi oleh skala.

Bentuk struktur spasial: METAPOPULASI



# DINAMIKA METAPOPULASI

## Contoh kasus orangutan Borneo



Representasi skematis fungsi metapopulasi orangutan di lanskap terfragmentasi.



## 06 RASIO SEKS

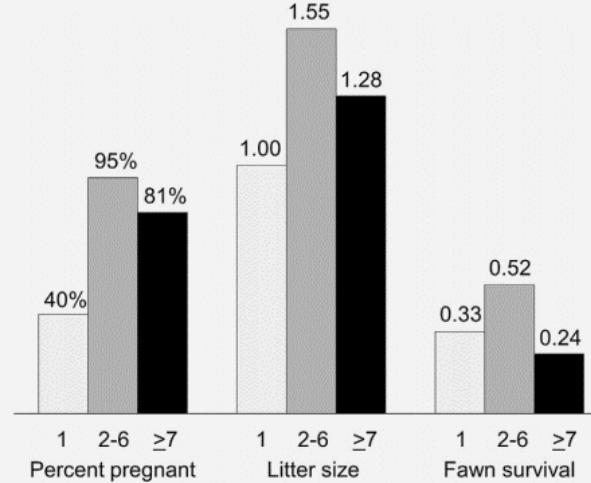
Proporsi jumlah individu tiap kelompok seks.

Jumlah betina (umumnya) lebih penting bagi laju pertumbuhan populasi.

- Pada banyak spesies, pejantan kawin dengan lebih dari satu betina.

# EFEK UMUR DAN SEKS

Contoh kasus *desert mule deer*



Pengaruh umur terhadap fertilitas, jumlah anakan, dan kelangsungan hidup anak *desert mule deer*.



# 07 ■ VARIABILITAS

Perbedaan antar individu dalam suatu populasi.

Variasi dapat karena sebab genetis, lingkungan, atau gabungan keduanya.

Contoh:

- Dimorfisme seksual
- Metamorfosis



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A close-up photograph of two prairie dogs. One is facing left, its head near the other's shoulder. The other is facing right, its head near the first. They appear to be grooming or showing affection. The background is a soft-focus yellowish-brown.

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A close-up photograph of two prairie dogs. One is facing left, its head near the other's shoulder. They are both brown with dark stripes. The background is a soft-focus yellow-green field.

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