Population Ecology Study Guide

1. List the three different types of ecology

   Population, Community, Ecosystem

2. Define "population"

   Group of same species living together in same place

3. What two types of data do we need to study population ecology

   Population Density
   Population Distribution

4. Define "fecundity"

   Number of offspring over a lifetime

5. What is the difference between density dependent and density independent limiting factors

   Density dependent affected by population density, density independent happen regardless of population size

6. Give three examples of density dependent limiting factors

   Food, Water, Disease

7. Give three examples of density independent limiting factors

   Climate Change, Tsunami, Earthquake

8. Define "carrying capacity"

   Population limit based on available resources

9. Compare exponential and logistic growth

   Exponential growth climbs rapidly and graphs like a J
   Logistic growth climbs rapidly then levels off, graphing like an S

10. Sketch the graph shape of population growth for an "R" species

R species exhibit exponential growth so they graph like a J

11. List three examples of "R" species

Oysters, Insects, Most fish

12. Sketch the graph shape of population growth for a "K" species

K species exhibit logistic growth so they graph like an S

13. List three examples of "K" species

Lions, Tigers, and Polar Bears

14. Given the following scenarios, calculate the rate of population growth

Scenario 1	Scenario 2	Scenario 3
Births = 100	Births = 350	Births = 10,001
Deaths = 20	Deaths = 12	Deaths = 2,000
Original Population Size = 1,000	Original Population Size = 3,576	Original Population Size = 320,000
r=birth-death/N	r=birth-death/N	r=birth-death/N
r=100-20/1000	r=350-12/3576	r=10,001 – 2000/320,000
r=80/1000	r=338/3576	r=8001/320,000
r=0.08	r=0.0.095	r=0.0.025

15. Biologically speaking are humans "R" species or "K" species

Humans reproduce like K species (few children, take care of them, reproduce slowly)

16. When graphed, do humans exhibit exponential or logistic growth

Exponential (J-shape) because we are not limited by our carrying capacity

17. List three reasons humans populations do not "crash" when they reach the carrying capacity

   Better agriculture
   Better health care
   Better technology

18. What is the estimated carrying capacity for humans on Earth

   10-15 billion

19. When did the rate of human growth peak

   1962

20. Why has the rate of human population growth been decreasing

   Lifestyle (having smaller families)
   Culture of Women (having fewer children or starting families later)

21. Compare direct population counts and indirect population counts

   Direct counts everything in the study area
   Indirect counts sample plots and uses ratios to estimate total numbers

22. What kind of count would you use for counting trees in a forest

   Spatial (because they are sessile)

23. What kind of count would you use for counting deer in a forest

   Temporal (because they are motile)

24. Given the following scenarios, calculate the CHANGE in population

Scenario 1	Scenario 2	Scenario 3
Births = 100	Births = 35	Births = 350
Deaths = 20	Deaths = 120	Deaths = 0
Emigration = 200	Emigration = 1,000	Emigration = 0
Immigration = 1,000	Immigration = 975	Immigration = 200
Original Population Size = 1,000		
	Change = (B+I) – (D+E)	Change = (B+I) – (D+E)
Change = (B+I) – (D+E)	Change = (35+975) – (120+1,000)	Change = (350+200) – (0+0)
Change = (100+1000) – (20+200)	Change = 1,010 - 1120	Change = 550 - 0
Change = 1,100 – 220	Change = -110	Change = 550
Change = 880		