

### Passage II

*Succession* refers to the change in species composition in a given area over ecological time.

Table 1 shows the bird species, the *dominant* (most common) plants, and the successional time in years (yr) on plots of abandoned farmland studied in Georgia.

Bird species	Successional time (yr)	1	3	15	20	25	35	60	100	150
	Dominant plants	Weeds	Grasses	Shrubs		Pines				Oaks
Grasshopper sparrow		Shaded	Shaded							
Eastern meadowlark			Shaded	Shaded						
Yellowthroat				Shaded	Shaded					
Field sparrow				Shaded	Shaded	Shaded				
Yellow-breasted chat					Shaded					
Rufous-sided towhee						Shaded	Shaded	Shaded	Shaded	
Pine warbler						Shaded	Shaded	Shaded	Shaded	
Cardinal							Shaded	Shaded	Shaded	
Summer tanager							Shaded	Shaded	Shaded	
Eastern wood pewee								Shaded	Shaded	
Blue-gray gnatcatcher								Shaded	Shaded	Shaded
Crested flycatcher									Shaded	
Carolina wren									Shaded	Shaded
Ruby-throated hummingbird									Shaded	Shaded
Tufted titmouse									Shaded	Shaded
Hooded warbler									Shaded	Shaded
Red-eyed vireo									Shaded	Shaded
Wood thrush										Shaded

Note: Shaded areas indicate bird species was present at a density of at least 1 pair per 10 acres.

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The estimated changes in *net productivity* (grams of organic mass produced per square meter per year [ $\text{g}/\text{m}^2/\text{yr}$ ]) and *biomass* (kilograms of organic material per square meter [ $\text{kg}/\text{m}^2$ ]) of plants on abandoned farmland in New York appear in Figures 1 and 2, respectively. Successional time is divided into 3 stages based on the dominant plants.

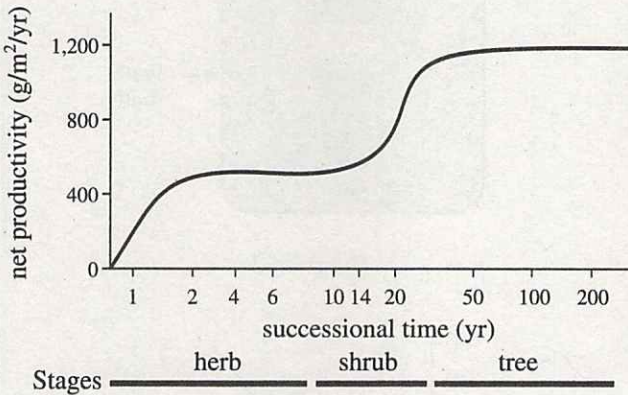


Figure 1

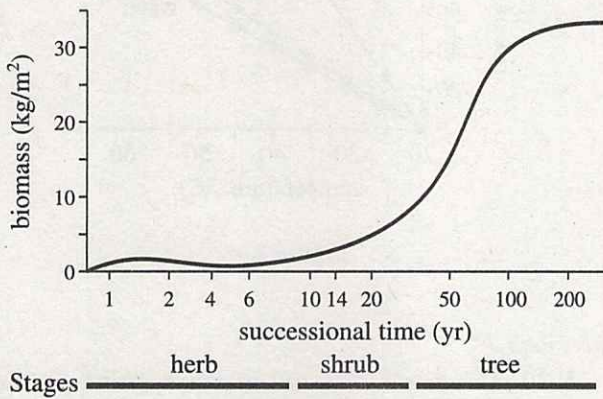


Figure 2

Figures and table adapted from William T. Keeton and James L. Gould, *Biological Science*. ©1986 by W.W. Norton & Company, Inc.

7. According to Figure 1, at the end of Year 50 the net productivity of the land was closest to:

- A. 15  $\text{g}/\text{m}^2/\text{yr}$ .
- B. 50  $\text{g}/\text{m}^2/\text{yr}$ .
- C. 425  $\text{g}/\text{m}^2/\text{yr}$ .
- D. 1,125  $\text{g}/\text{m}^2/\text{yr}$ .

8. Based on the data in Figures 1 and 2, the researchers should make which of the following conclusions about the overall change in net productivity and biomass over the 200 years studied?

- F. Both net productivity and biomass increased.
- G. Both net productivity and biomass decreased.
- H. Net productivity increased and biomass decreased.
- J. Net productivity decreased and biomass increased.

9. According to Figure 1, total net productivity increased the most during which of the following time periods?

- A. From the end of Year 2 to the end of Year 4
- B. From the end of Year 4 to the end of Year 14
- C. From the end of Year 14 to the end of Year 50
- D. From the end of Year 50 to the end of Year 200

10. Which of the following conclusions about net productivity is consistent with the results shown in Figure 1 ?

- F. Net productivity was lowest when shrubs were the dominant plants.
- G. Net productivity was lowest when trees were the dominant plants.
- H. Net productivity was highest when herbs were the dominant plants.
- J. Net productivity was highest when trees were the dominant plants.

11. A student learned that a particular plot of abandoned farmland in Georgia supported eastern meadowlarks, yellowthroats, and field sparrows at a density of at least 1 pair per 10 acres. Based on Table 1, the student would predict that the dominant plants on this plot of land were most likely:

- A. weeds.
- B. grasses.
- C. shrubs.
- D. pines.

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