

A photograph of a forest. The upper portion shows several tall, thin tree trunks against a background of green and yellowing leaves. The lower portion shows a forest floor covered in a thick layer of brown pine needles, with various green plants and some yellowing leaves in the foreground.

Changes in Ecosystems: Ecological Succession

- http://www.youtube.com/watch?v=iZA5yfrzLV8&feature=BFa&list=SP8F2AF6D5E617BA4B&lf=list_related

Definition:

- Natural, ***gradual changes*** in the types of species that live in an area; can be primary or secondary
- The gradual replacement of one plant community by another through natural processes over time

Primary Succession

- Begins in a place without any soil
 - Sides of **volcanoes**
 - Sides of mountains
 - Rocky environments
- Starts with the arrival of living things such as **lichens** that do not need soil to survive
- Called **PIONEER SPECIES**



<http://botit.botany.wisc.edu>



<http://www.saguaro-juniper.com/>

Primary Succession

- Soil starts to form as lichens and the forces of weather and erosion help break down rocks into smaller pieces
- When lichens die, they decompose, adding small amounts of organic matter (***nutrients***) to the rock to make soil



<http://www.life.uiuc.edu>

Primary Succession

- Simple plants like mosses and ferns can grow in the new soil



<http://www.uncw.edu>



<http://uisstc.georgetown.edu>

Primary Succession

- The simple plants die, adding more organic material
- The soil layer thickens, and grasses, wildflowers, and other plants begin to take over

<http://www.cwrl.utexas.edu>

Primary Succession

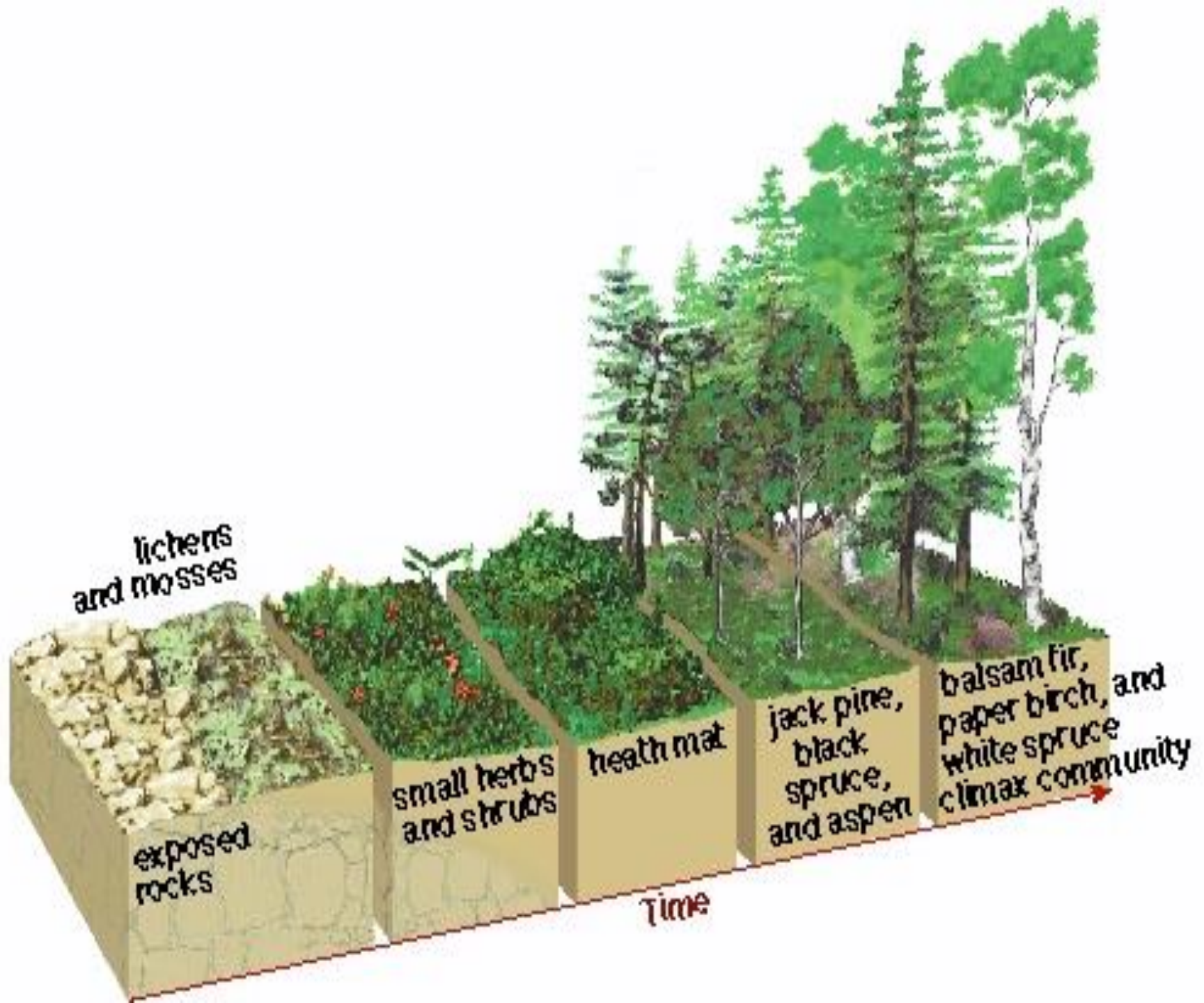
- These plants die, and they add more nutrients to the soil
- Shrubs and trees can survive now
- The amount of Biodiversity is increasing so the ecosystem is becoming more stable



Primary Succession

- Insects, small birds, and mammals have begun to move in
- What was once bare rock now supports a variety of life
- ***Biodiversity*** increases even more





PRIMARY SUCCESSION for the temperate deciduous forest

0 years



300 years



Regents Practice

- 1 The ability of lichens to alter their environment, enabling other organisms to grow and take their places in that environment, is one step in the process of
- (1) biological evolution
 - (2) ecological succession
 - (3) maintenance of cellular communication
 - (4) differentiation in complex organisms

Regents Practice

2 Which order of succession of natural communities would most likely occur in New York State?

- (1) grasses → trees → bushes
- (2) trees → bushes → grasses
- (3) bushes → grasses → trees
- (4) grasses → bushes → trees

Secondary Succession

- Begins in a place that already has soil and was once the home of living organisms
- Occurs faster and has different pioneer species than primary succession
- Example: after forest fires



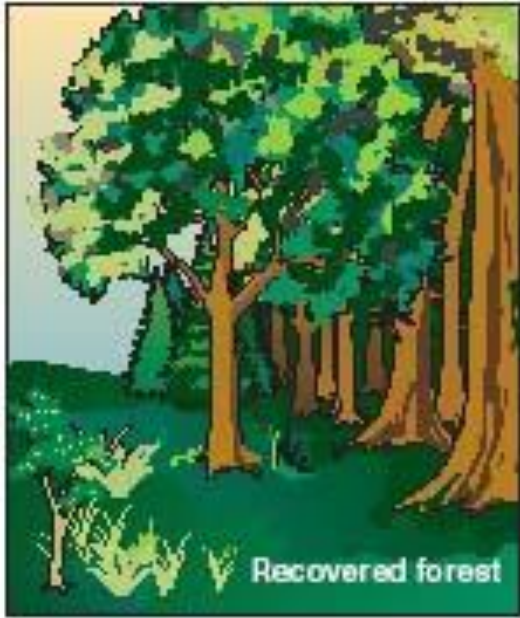
1.



2.



3.



4.

Sunrise Wildfire in the Long Island, NY Pine Barrens - August 1995

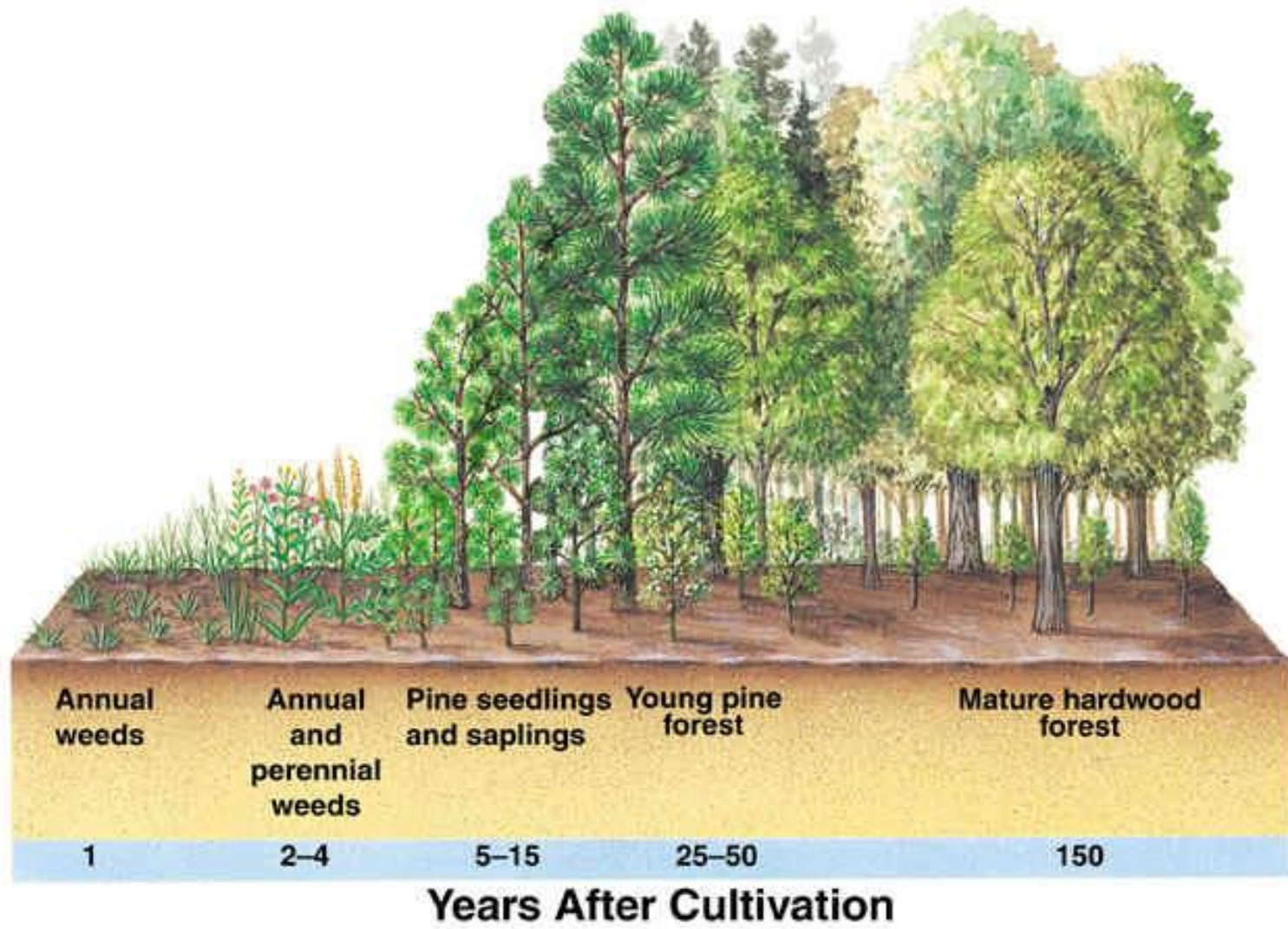


*Photo by, and used here by courtesy of, Chief Dean Culver,
Westhampton Beach Fire Department. (c) 1995 Dean Culver*



Climax Community

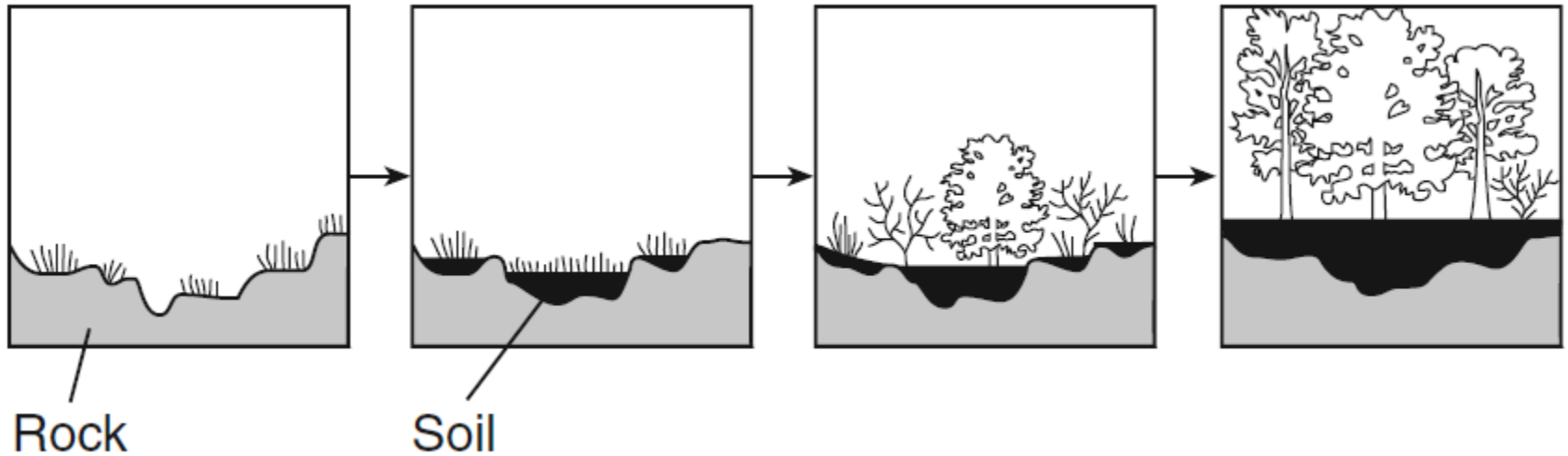
- A stable group of plants and animals that is the end result of the succession process
- Does not always mean big trees
 - Grasses in prairies
 - Cacti in deserts



<http://www.biologiepagina.nl/Flashfiles/successie.swf>

<http://www.youtube.com/watch?v=f6kUpvoTvtI>

1. The diagram represents the changes in an area over time.

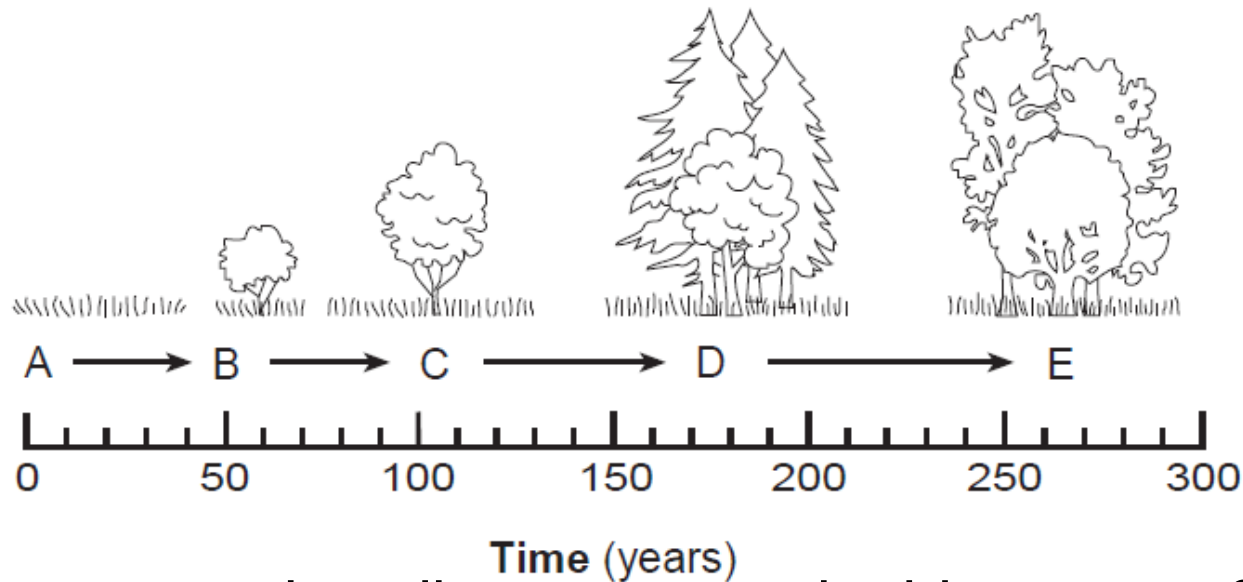


This series of changes in the area over hundreds of years is known as

- (1) evolution
- (2) feedback

- (3) ecological succession
- (4) direct harvesting

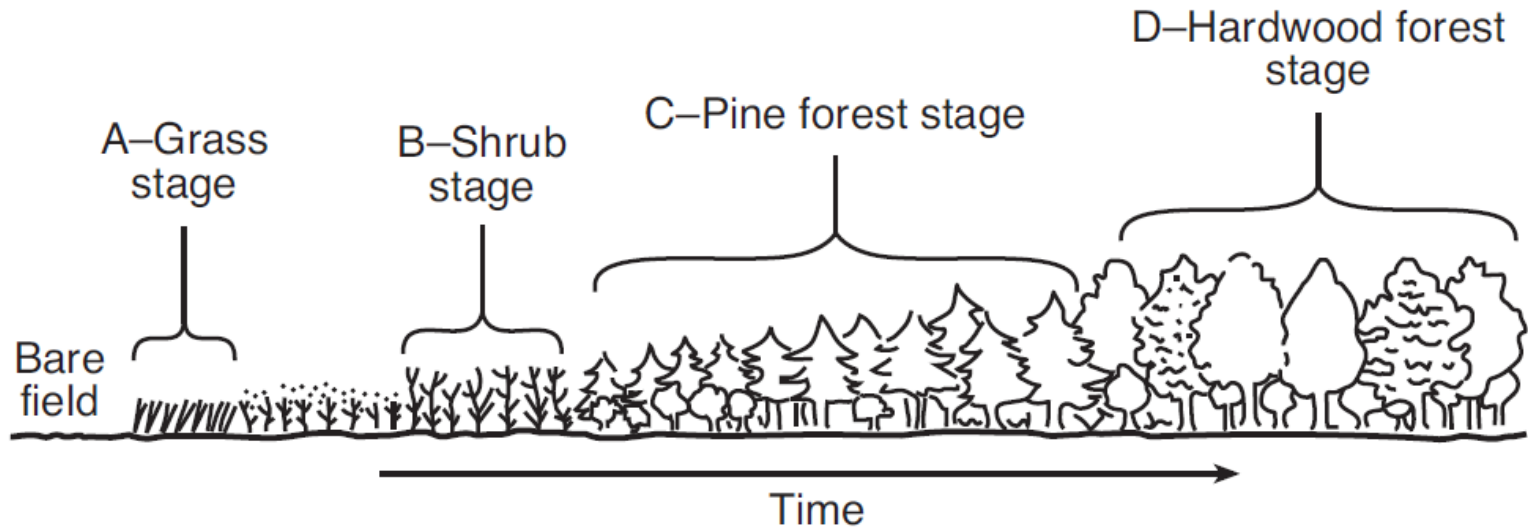
2. An ecological process is represented below.



Which statement describes an event in this process?

- (1) Community *B* modifies the environment, making it suitable for community *C*.
- (2) Community *D* modifies the environment, making it suitable for community *C*.
- (3) Community *E* will develop into community *A*, if the environment remains stable.
- (4) Community *A* organisms will develop directly into community *D* organisms.

3. The diagram below represents different stages of an ecosystem over a period of time.

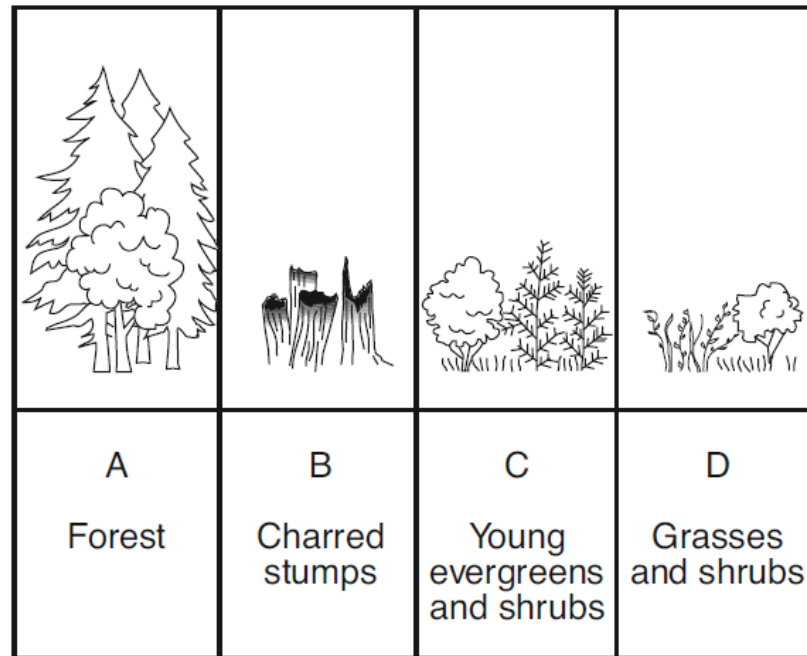


Which stage of the ecosystem has the greatest long-term stability?

- (1) *A*
- (2) *B*
- (3) *C*
- (4) *D*

4. Over a long period of time, the stages represented in the diagram below were each present in a particular ecosystem.

Stages in an Ecosystem



After a forest fire, what is the most likely order in which these stages appeared?

- (1) $D \rightarrow C \rightarrow A \rightarrow B$ (3) $A \rightarrow B \rightarrow C \rightarrow D$
(2) $B \rightarrow D \rightarrow C \rightarrow A$ (4) $B \rightarrow C \rightarrow D \rightarrow A$