

**Directions:** Read all the directions thoroughly and make sure to read the overview and objectives. Answer all questions below on a separate piece of paper, and be sure to visit all the web links as indicated. When visiting the web links, make sure you read all the information and look over the images, and answer any associated questions.

**Objectives:** After studying this material you should be able to:

1. Describe an ecosystem and explain how the biological community interacts with its environment.
2. Explain the role of disturbance in (natural and managed) ecosystems and its relationship to succession.
3. Explain what primary succession is and give some real world examples.
4. Explain what secondary succession is and distinguish it from primary succession.
5. Describe how living components in the ecosystem change nonliving components during succession.

## **Ecological Succession - Overview**

**From the Latin, succedere, to follow after**

**"Change in the species composition of a community over time." (Lewis, Life glossary)**

- **Primary Succession** follows the formation of new land surfaces consisting of rock, lava, volcanic ash, sand, clay, or some other exclusively **mineral substrate**.
  - This means that there is **NO SOIL** present.
  - Soil is a mixture of mineral material, decaying organic material, and living organisms.
- **Secondary Succession** follows the destruction or partial destruction of the vegetation area by some sort of disturbance, like a fire, windstorm, or flood that leaves the soil intact.
- **Pioneer species** initiate recovery following disturbance in both primary AND secondary successions

Pioneers "pave the way" for later colonists by altering the biotic and abiotic environment:

- soil stabilization
  - soil nutrient enrichment (organic matter and [biological nitrogen fixation](#))
  - increased moisture holding capacity
  - light availability
  - temperature
  - exposure to wind
- Species composition tends towards a **Climax Community** through succession.
- The climax community describes an end product of succession that persists until disturbed by environmental change.
- Succession occurs at large scales involving higher plants and animals, but may involve microbial communities on a smaller scale.

---

Visit the web link → <http://ilo.ecb.org/SourceFiles/succession.swf>

**Click on the general succession link and review the information**

1. How is primary succession different from secondary succession?
2. What impact do humans have on succession?

**Go to the primary succession tab** at the top of the page. Maximize the temperature and moisture in the simulation.

3. Describe the example indicated in the simulation
4. About how many years does the formation of brown soil require?
5. About how long did the primary succession event take? Describe the progression of the event
6. List at least two other examples of primary succession you can think of.

**Go to the secondary succession tab** at the top of the page and watch the animation.

7. How does the rate of secondary succession compare to primary succession?
8. Why are the rates of succession so different between the primary and secondary succession events? Explain.
9. Fire is one cause of secondary succession. List at least four other examples of secondary succession.
10. Imagine a lawn on campus or in someone's yard. Are there any examples of succession there now? If no one maintained it for five years, what might it look like? What would it look like after 10 years? 50? 100?

**Go to the quiz tab** at the top of the page, making sure to complete page 1 & 2 of the quiz link.

11. Draw and label the end result of the quiz on page 2, including the years for each stage.

Fire Succession in San Diego county Click on each of the links and answer the associated questions

**Chaparral**→ <http://interwork.sdsu.edu/fire/resources/chaparral-characteristics.htm>

12. What is the difference between an obligate seeder and an obligate sprouter?
13. According to the article, what has been the impact of fire suppression strategies in general in chaparral communities in San Diego.
14. According to the article, what might happen if human population in chaparral areas continues to increase, and the frequencies of wildfires become more prevalent?

**Mixed Coniferous Forest**→ <http://interwork.sdsu.edu/fire/resources/conifer-forest.htm>

15. How have fire suppression efforts in coniferous forest influenced shade tolerant plants?
16. In National Forests, government policy has been to suppress forest fires whenever possible for the last century. Now some regions are starting to allow fires to burn. Based on what you know about succession, what impact do you think this might have in the mixed coniferous forests of San Diego and areas like it?
17. List the 5 species of conifers and 3 species of oak common to the mixed coniferous forest of San Diego county.

Click on the link→ <http://www.fire-ecology.org/education/doc1.htm> (Fire Ecology)

18. What are some of the adaptations common to plants and trees in fire prone areas?
19. According to the article, how does wildfire and the wildfire recovery process influence animal biodiversity?
20. How do “mature” coniferous forests or the coniferous forest *climax community* rate in terms of biological productivity compared to other states of coniferous forest succession stages. What implications do you see this having on fire suppression programs or controlled burn programs?
21. List the six major U.S. fire-adapted ecological communities.
22. What is your opinion of prescribed fires and their role after reading the article?

## **Fire prevention and preparedness in your home**

Click on the link→ <http://www.wildfirezone.org/beforefire/index.asp>

**23. Click through the tabs at the top of the page, looking over the suggestions regarding fire prevention and preparedness. Focus on your own home, condo, apartment, etc. where you like and list the top preparation tips that would be applicable specifically to your own dwelling**

Sources:

[www.pbs.org](http://www.pbs.org)

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

<http://ilo.ecb.org>

<http://www.fire-ecology.org>

<http://www.wildfirezone.org>