

Succession and Climax

Teacher Background

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'The concepts of Succession and Climax are important to understanding the food webs seen in Michigan habitats.

Let us suppose that you owned a field in an area that was covered by deciduous forest before the coming of Europeans.

Around the field in unused areas of land are species of the trees, shrubs, and herbs characteristic of that region.

Now let us suppose that you cleared that field of vegetation completely. Since we are dealing with an imaginary field we can imagine that you even had some way of destroying dormant seeds buried in the soil. As the years pass, what would be the nature of the plant life that would inhabit the field?

The first pioneer plant forms might be mosses and lichens, but they would soon be followed by various grasses and other herbs, especially those with airborne seeds. The field would then be covered by a growth of herbaceous plants of the sort commonly lumped together as "weeds."

Next to appear, within two or three years, would be woody plants of the shrub form, their seeds brought in by winds or animals. These would be species the seedlings of which could exist in full sunlight and in root competition could successfully strive against the temporarily dominate grasses and herbs. As the shrubs grow larger their shade reduces the number of herbaceous plants that require strong light.

However, in the shade of the shrubs, see seedlings arise, the tree seeds likewise having been brought in by wind or animals. They are species which are able to begin growth in the shade of the shrubs, but achieve most rapid growth in full sun after they eventually overtop the shrubs. The first group of shrubs is then in turn largely eliminated by the shade cast over them by the trees, and replaced as a forest understood by shade-tolerant species.

However, as noted above, these pioneer tree species require full sun or sunny days for vigorous growth. Their own saplings do not thrive in the shade of their parents. These trees will be replaced by shade-tolerant species or those which thrive in cloudy day sunlight.. When an aggregation of tree species has been reached that successfully reproduces its own kind, generation after generation, the plant association has become stable and is called a climax association. To phase it another way, a climax association is one that is capable of perpetuating itself under the conditions imposed by its own

existence. Unless disturbed, a climax association may not change for many centuries. However, the particular species comprising the climax will be determined by physical factors of climate, soil, temperature, terrain, and locality.

A rule of thumb to determine whether a forest area is a climax or not is to see if the tree sapling growing there are of the same species as the mature trees. If they are, then the forest is probably a climax formation; if not, the area is still undergoing successional changes.

Of course, each of succession and climax are stage of succession includes an association or species which find the conditions needed to food web of animal survive in the habitat of that stage.

Successional changes leading to a climax formation may require a long period of time, possibly as much as several hundred years, depending upon the severity of the initial disturbance and local conditions. The factors that enter into its determination may be quite complex. However, the facts observable, regardless of how obscure the determinants might be.