

Repairing the Post-Tsunami Landscape: An Ecologist's Perspective

The Tohoku earthquake that struck off the coast of Japan on the afternoon of March 11, 2011, and its resulting tsunami are estimated to have killed more than 15,000 people. The tsunami is believed to have caused over \$200 billion in property damage. This natural disaster crippled nuclear reactors, destroyed towns, and led to huge financial losses.

The tsunami also had a great impact on the landscape of our island nation. Travelers to Japan frequently visit major cities such as Tokyo or Kyoto. They do not realize that forested regions cover more than two-thirds of our country's total area. These regions saw major damage. Plants were ripped from their roots, and coral reefs off the Japanese coast were destroyed by the tsunami's giant waves. Wildlife fled, drowned, or simply vanished.

Japanese and international attention initially focused on rescuing people and calming the economy. But now we must find ways to help damaged forests, grasslands, and corals to grow anew. This will spur native animal species

to return to their homes. Several months have passed since the disaster. Now is the time to begin the long process of returning these ecosystems to their original beauty.

The tsunami presents an excellent chance for scientists to study the effects of secondary succession. This is a process during which an event alters or destroys plant life in an established ecological region such as the Japanese forests. Natural disasters like tsunamis and forest fires can lead to secondary succession. Human activities like livestock grazing or logging can as well.

The plant and animal growth that we hope to re-establish in the natural areas hit by the tsunami will be unlike new growth found in primary succession. During this type of succession, life develops in barren areas that do not have topsoil. In primary succession, events like a volcanic eruption can lead to hardened lava flows where few (if any) plants or animals can live. Soil and other organic material can eventually accumulate in these areas, and small creatures like spiders will make a home on the lava flows.

The Japanese landscape was robust and beautiful prior to the tsunami. As ecologists, we must work together to ensure that plant and animal life can return to these areas. Our work must include clearing out debris from the affected areas, and establishing guidelines for returning the areas to their previous natural state.



Tsunamis can cause tremendous damage to landscapes.

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While secondary succession is likely to occur naturally as animals return to their habitat and dormant or buried plants grow anew, we must not ignore these areas and hope that the tsunami damage will fix itself on its own.

Now is the time to get involved! It may take years to assess the tsunami's final toll on the Japanese landscape. Let us now begin the processes of replanting and rebuilding.



Healthy coastal ecosystems include a variety of plant and animal species.