Community Guide to Ecological Revitalization

What Is Ecological Revitalization?

Ecological revitalization is the process of returning a contaminated site to more natural conditions, similar to what existed before the property was disturbed. Industrial, commercial, mining and other uses of a property can contaminate soil, displace plants and animals, and disrupt the ways these organisms interact with each other and their environment. Revitalizing land into a meadow, forest or wetland can recreate habitats and other natural characteristics of the area. This process can give new life to a community through the creation of a new park, natural recreational area or nature preserve.

How Does It Work?

Returning a site to a natural environment involves different approaches, depending on the property and how it was altered during development and use. Ecological revitalization first requires an understanding of the plant and animal species, soil types, weather, and other characteristics of the site, both past and present. This may involve looking at old photographs and maps of the site, visiting nearby natural areas, and talking to local residents. Ecological revitalization is most successful when considered during site investigation and cleanup. Common steps include:

- Demolishing buildings and other infrastructure.
- Regrading the ground surface to remove or create slopes.

- Bringing in fertile soil or adding nutrients and other natural materials, also known as soil amendments, to existing soil to help plants grow.
- Creating or restoring wetlands and natural stream channels.
- Planting native trees, grasses and other vegetation.
- Reestablishing wildlife.

The links between soil, plants and wildlife, including birds, insects and even microscopic organisms, are an important part of ecological revitalization. For example, many native flowering plants in the United States rely on bees, bats, hummingbirds or other “pollinators” that feed on nectar to help them reproduce and spread. This is a valuable ecosystem service as flowering plants and food crops depend on pollinators for their reproduction.

Ecological revitalization can support protection of human health and the environment by creating a natural system where both plants and animals can thrive.

How Long Will It Take?

An ecological revitalization project may take anywhere from a few months to many years. The time it takes to reestablish natural habitat will depend on several factors that vary from site to site. For example, ecological revitalization will take longer where:

- Plants have a long life cycle and take longer to reach maturity.
- Unfavorable weather for seed germination or plant growth (such as drought) occurs.
- Plants that animals or insects have eaten must be replaced.
- Stream channels must be restored or stabilized to prevent severe erosion.
- Habitats, such as wetlands, need to be built from scratch.

- Soil conditions such as temperature, nutrient levels and microorganism populations must be modified.

Is Ecological Revitalization Safe?

When properly planned and managed, ecological revitalization is very safe. If there is any chance that contaminated soil or groundwater will remain at the site, EPA will combine revitalization with cleanup methods that isolate contaminants from people, plants and wildlife. For instance, a protective cap may be placed over contaminated soil or a vertical engineered barrier may be placed around the contaminated soil or groundwater. (See *Community Guide to Capping* and *Community Guide to Vertical Engineered Barriers*.) Revitalization also can be conducted in combination with methods that continue to actively clean up contamination.

How Might It Affect Me?

Generally, ecological revitalization does not cause much disruption to the surrounding community. Initial work may involve grading or tilling the soil with earth-moving equipment. You may hear equipment noise or detect odor if the soil is mixed with natural amendments, such as compost, manure and yard/wood waste. Airborne dust can be controlled by watering down the soil.

Why Use Ecological Revitalization?

Ecological revitalization is used with soil and groundwater cleanup methods to improve the condition of a contaminated site. It can help isolate or remove contamination, preventing contact with people and wildlife. It also can return land to an attractive environmental resource for the community. Revitalized sites help create wildlife habitats, improve air and water quality, and provide added greenspace for parks, recreation and nature preserves. Returning contaminated sites to beneficial use can lead to increased property values, recreational centers and protected open space in what are often densely developed areas. Ecological revitalization has been selected for use at hundreds of Superfund sites and other cleanup sites across the country.

Superfund site before and after ecological revitalization.

Example

Trash in the Army Creek Landfill in Delaware contaminated nearby Army Creek and local water supply wells. As part of the soil and groundwater cleanup, a protective cap was built over the remaining lightly contaminated soil. EPA planted grasses, wildflowers and other native plants to provide nesting and feeding habitats for migrating birds. EPA installed bird boxes along the creek to encourage nesting, and planted gooseberry as a food source.

The grass is mowed infrequently (once every 3 years) during the fall so that bird habitats are not disturbed during nesting season. Throughout the spring and summer, the tall grass provides seeds and shelter, which are enjoyed by insects, birds, and other small animals. EPA also built wetlands to provide habitat for many species of plants, animals, and birds. Ecological revitalization transformed the site into a vibrant wildlife enhancement area for the community.

For More Information

- About this and other technologies in the Community Guide Series, visit: https://clu-in.org/cguides or https://clu-in.org/remediation/
- About use of cleanup technologies at a Superfund site in your community, contact the site's community involvement coordinator or remedial project manager. Select the site name from the list or map at http://www.epa.gov/superfund/sites to view their contact information.

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