

GLOSSARY

Technical Terms

These terms are used in this book. The listing is divided into two parts. Part 1 are terms used in Sections I and II, and related to volcanism and succession. Part 2 includes terms used to describe plants, as used in Section III.

Part 1. Ecological terms

alien (exotic) species: species introduced into an area by human activities.

allogenic factors: processes that affect species composition from beyond the plot, for example, landscape factors

alternative states: vegetation samples in apparently similar habitats that have maintained contrasting species composition.

alternative stable states: as above, but showing no signs of further successional change.

anthropogenic: effects resulting from direct or indirect human activities.

autogenic processes: site-specific environmental and species-specific biotic processes formed within the system and that affects its composition (e.g., competition).

assembly rules: principles that predict how species will combine during succession.

ballistic dispersal: expelling seeds from a fruit by an explosive mechanism (e.g., lupines).

chronosequence: vegetation samples located in habitats assumed to be of different ages and hence to describe a successional pathway; compare to permanent plots.

climax: the last stage in succession where moderately stable vegetation is in equilibrium with climatic and biotic factors such that no further directional change is likely.

cohort: members of a plant population that were produced in the same year.

colonization: the process by which organisms disperse to, establish and reproduce in a habitat.

community assembly: the accumulation of species and development of biotic interactions during succession.

community type (CT): a term applied to collections of vegetation samples that share floristic features; may be a formal description or used for a particular descriptive purpose.

competition: a negative interaction in which one individual causes detrimental effects on another by the denial of a limited resource, e.g., nitrogen, light or water.

convergence: describes the case when vegetation samples develop greater floristic similarity.

cover: a measure of plant dominance determined by the vertical projection of the canopy within a sample area, expressed as a percentage of the sample area.

detrended correspondence analysis (DCA): a method to relate vegetation samples to each other based on their species composition.

diaspore: general term for a reproductive dispersal unit in plants; includes seeds, fruits and spores.

disharmony: distribution of species types, dispersal types, growth forms, etc. on an isolated habitat that differs strongly from an expectation based on similar habitats in which dispersal limitations do not occur.

dispersal (in plants): a process, often aided by wind, water, gravity or animals, by which seeds and spores travel from their parents to a new site.

dispersal spectrum: the proportion of species found in each dispersal class; spectra may also summarize a sample of vegetation by growth form or other collective traits.

divergence: describes the case when vegetation becomes floristically less similar.

diversity: a statistical measure of community that accounts for the relative abundance of species and their number (see also species richness); it ranges from 0 to a maximum determined by the number of species; it increases with the number of species and as the species become more evenly abundant.

ecosystem: a cohesive unit including the biota, the physical environment and the interactions among them; unusually constrained by natural boundaries (e.g., a watershed) or by steep gradients of environmental change (e.g., a lake).

ecotone: the spatial boundary between two plant communities or habitats; may be applied to transitions in time.

ejecta: any material forcibly expelled from a volcano (e.g., pyroclastic materials).

elaiosome: small fleshy structures rich in oils and proteins that are attached to seeds of, for example, lupines; they attract ants and are thus an aid to dispersal (Greek, *élaion*, “oil” and *soma*, “body”).

ectochory: seed dispersal accomplished by attachment to the exterior of an animal; barbs, hooks, fuzz and long appendages to the seed suggest this mechanism; see zoochory.

endochory: seed dispersal after the fruit has passed through the gut of a bird or mammal; see zoochory.

establishment: successful reproduction within a newly colonized habitat.

facilitation: any influence of one species that improves the survival, growth or reproduction of another species.

hysteresis: describes successional returns to a previous state by a different trajectory, or development to an alternative state.

inhibition: mechanisms that reduce the growth or survival of one plant that result from the actions of another, usually due to competition, but could result from chemical interactions.

legacy: describes any organic material (e.g., plants, animals, seeds, roots, soil and debris) that survives a disturbance and that subsequently plays a major role in secondary succession.

life form: broad categories of plants with similar degrees of protection of their dormant regenerative organs (e.g. trees, perennial evergreen herbs); see Chapter 11.

microsite: small-scale habitat distinct from the usually hostile surroundings; often they form *safe-sites*, which also connotes conditions more favorable for growth than the surroundings.

monitoring: making a set of repeat observations of biological or physical features of a site.

mosaic: a patchwork of vegetation.

mycorrhizae: a mutually beneficial relationship between fine roots of many species and certain specialized fungi that enhances mineral uptake by the plant and provides the fungus with carbohydrates.

myrmecochoy: dispersal by ants; usually the transported seed has a small oily organ designed to feed particular species of ant.

nitrogen fixation: conversion of nitrogen gas to ammonia or other nitrogenous compounds mediated by microorganisms hosted by certain plants (e.g. lupines, alder).

nurse plant: an established plant that creates safe-sites for seedlings, usually of another species.

ordination method: statistical approach in which vegetation samples are related to one another on the basis of their species composition.

perennial plant: species that persist for several years; may be herbaceous or woody.

permanent plots: permanently marked sites that are repeatedly sampled in order to describe succession; compare to chronosequence.

physiognomy: the general appearance of the dominant life forms in vegetation, (e.g. meadow).

pioneer: a plant that first colonizes a disturbed site, thereby starting succession.

primary succession: ecosystem development starting on a barren surface devoid of any legacy; common in blast and pyroclastic zones.

priority effect: successional consequences resulting from the early arrival of one, or another, species; may occur when a colonizer alters a trajectory by competitive or facilitative means such that alternative local trajectories occur. They may persist or be overwhelmed by competitive species.

relict species: a species surviving primarily in refugia within a newly created landscape (see legacy).

ruderal: a weedy plant that colonizes recent disturbances; often fast growing and prolific.

safe-site: a form of microsite particularly conducive to establishment of at least some species.

secondary succession: species change where soils and some biota survive; common in blow-down areas, as well as in many sites after fire.

seed bank: dormant seeds found in the soil; provide a “memory” of prior conditions.

seed rain: the input of plant propagules entering sites from donor sources.

species richness: the number of species in a sample.

stochastic: pertaining to any random or unpredictable process, e.g., seed dispersal that is affected by landscape factors.

strategy: an evolutionary response to a particular set of environmental constraints, e.g., a ruderal strategy succeeds in a fertile, disturbed habitat; concept modernized by J. P. Grime.

succession: the processes by which species composition gradually changes and ecosystem processes develop following a major disturbance.

target: the compositional goal of a restoration project; the presumed end point of succession.

trajectory: describes species composition changes through time; can be indexed using methods of ordination; trajectories of different plots in a habitat may become more similar (converge) under the influence of similar environments or become less similar (diverge) in response to subtle habitat differences or priority effects; also called a “sere”.

usual suspects: the pioneer species that typically comprise the first wave of colonists—pearly everlasting, white hawkweed, cat’s ear and fireweed.

zoochory: seed dispersal by the agency of animals, either internally or externally.

Part 2. Geological terms

a’a lava: a basaltic lava that is rough and fractured (Hawaiian = rough lava).

aeolian: pertaining to wind dispersal of seeds and organic matter; named for the Greek god of the wind.

aeolian zone: habitats initially supported by importation of organic matter and dispersal units.

alluvial deposits: material that is deposited from moving streams.

ash: fine-textured pulverized rock forcefully ejected from a volcano.

ashfall: a deposit of volcanic ejecta that is usually sorted according to the distance travelled; close to the volcano, coarse-textured deposits predominate.

basalt: on Mount St. Helens, a black to reddish igneous volcanic rock extruded from the crater or fissures; due to low viscosity it flows slowly over the landscape; forms lava deposits.

blast: on Mount St. Helens, the directed, lateral explosion of incandescent, pulverized ash and rock that devastated a huge swath of landscape.

blast zone: on Mount St. Helens, that large region resulting from the initial blast; impacts ranged from the total annihilation of life and soil to searing the leaves of trees; includes zones where trees were removed, trees were toppled and dead trees where searing heat scorched leaves and killed most trees..

blown-down zone: on Mount St. Helens, that portion of the blast zone in which soil and understory often remained, but trees were snapped or toppled to the ground due to the force of the eruption..

dacite: a viscous volcanic rock rich in silica (ca. 65%); it forms most of the domes found in the crater; usually associated with violent explosive eruptions.

debris avalanche: a saturated mass of unsorted material of all kinds that falls under the force of gravity in a disorganized tumble; the first phase of the Mount St. Helens eruption started with the largest debris avalanche in historic times; deposits are often thick and hummocky.

desert pavement: smooth, rocky surface resulting from wind erosion that removes dust, leaving heavier pebbles and rocks behind.

fumarole: a vent for steam, hydrogen sulfide and other gasses that form clouds and provide local moisture; those on Mount St. Helens were ephemeral, formed on pyroclastic deposits where hot rocks contacted ice or water; from Latin, *fumus*, smoke.

hummock: large, steep-sided, largely conical mounds resulting from the debris-avalanche flow.

jökull: Icelandic term for glacier.

jökulhlaup: Icelandic term for a glacial outwash flood; originally applied to events triggered by volcanic eruptions beneath a glacier or geothermal heating; extended to describe any abrupt flood from beneath or in front of glaciers. .

lahar: a wet slurry of mud, rocks and miscellaneous other material created by rapidly melting snow and glacial ice during an eruption (from Javanese, “*berlahar*”).

lahar deposit: deposits left behind as a lahar flows on; these are usually relatively thin (up to a few meters) and well sorted.

lateral blast: nearly horizontal eruption from the side of a volcano consisting of hot materials that sweep across the landscape.

lava: molten magma that has been extruded from a crater or fissures; when cool, it forms rocks that require many years to develop vegetation; from Latin *labes*, a fall or slide, coined by F. Serao in describing a 1737 event on Vesuvius.

mudflow: similar to a lahar (see above), but can refer to any rapidly moving slurry of mud and water.

pāhoehoe lava: basaltic lava with a smooth, often ropy surface (Hawaiian for smooth lava).

phreatic eruption: a volcanic eruption that results from water contacting magma while under pressure; the surrounding rocks are blasted into the air.

Plinian eruption: a violent eruption of gas and tephra often injected several km into the atmosphere; first described by Pliny the Elder while watching Vesuvius in A.D. 79.

pumice: a silica-rich, frothy, light-colored rock ejected during eruptions; it floats in water.

pyroclastic flow: swift (over 300 km/hr.), turbulent, searing (over 700 C°) volcanic ejecta from a vent or crater; from Gr. *pyro* = fire and *clastic* = fragmented, hence, rocks fragmented at very high temperatures.

pyroclastic-flow deposit: sediments left behind by a passing pyroclastic flow that are usually underlain by poorly sorted gravel, capped by fine, infertile material subject to rapid erosion.

refugia: sites that escaped effects of volcanic impacts.

removal zone: that portion of the blast zone from which most vegetation was forcibly removed.

rill: small water erosion features that may develop into intermittent creek beds; important sites for seedling establishment.

riparian: pertaining to habitats along stream banks.

scorch zone: the area of standing dead trees fringing the blown-down zone; the heat of the blast killed leaves, but its force did not topple trees (often called the seared zone and standing-dead zone).

scoria: a form of lava that has many holes, but unlike pumice, it will not float in water; it is usually black to dark brown in color.

talus: the debris of rocks at the base of steep slopes.

tephra: fragmented volcanic materials expelled during an eruption that subsequently returns to earth; deposits are size-graded, with fine textured tephra (i.e., ash) coming down at long distances, while rocks fall near to or on the crater.

Part 3. Descriptive taxonomic and life-history terms.

achene: any dry fruit consisting of a single seed, e.g. sunflowers.

adventitious: relating to any structure developing from an unusual place, e.g. leaves directly from a stem.

alternate: leaves or other structures arranged singly, rather than opposite or whorled.

annual: plants that normally flower in the same year they germinate, then die.

awn: a bristle attached to a grass seed.

biennial: plants that normally require two seasons to produce fruit;

blade: the flat part of a leaf.

bract: a reduced leaf that encloses a flower or inflorescence.

Bryophyte: a moss or liverwort.

capsule: a fruit that is dry, composed of two or more carpels and which opens to release seeds.

catkin: a slender, drooping inflorescence comprised of many small flowers (usually either male or female) lacking corolla or calyx that are normally pollinated by wind.

cordate: any structure that is heart-shaped, usually with a basal notch, e. g., a leaf.

dehiscence: the process of opening to release seeds, spores, etc.

deltoid: any structure that is triangular, e.g., a leaf.

disk flower: central, tubular flowers in the head of many sunflowers may be surrounded by ray flowers.

elliptic: any structure with round ends, widest in the middle.

entire: any structure that is smooth, lacking teeth or indentations; applied mostly to leaves.

follicle: similar to a capsule, but having only one carpel; splits longitudinally to release seeds.

frond: the green, above ground portion of a fern, analogous to leaves in flowering plants; technically comprised of a stipe (petiole) and rachis (blade).

glabrous: smooth, lacking in hairs.

glaucous: appearing white due to a waxy powder.

glume: in grasses, a bract that subtends a floral structure.

hirsute: densely covered with hairs.

hydrophyte: a plant restricted to aquatic habitats; leaves may be submerged or floating.

inflorescence: general term for a collection of flowers.

lanceolate: shaped like a lance, i.e., very narrow, wide in the middle, tapering towards both ends.

ligule: a membranous structure at the top of the sheath, that place from which the grass blade extends from the culm.

oblanceolate: lanceolate, widest part near the tip.

oblong: rectangular.

obovate: egg shaped, with widest portion towards the end of the structure.

opposite: leaves or other organs situated on either side of a stem or other structure.

oval: a wide ellipse in shape.

palmate: leaves divided like fingers of a hand.

pappus: various hairs, scales or bristles topping an achene that promotes dispersal.

perennial

petal: part of flower, usually colored, that forms the attractive ring surrounding sexual parts (collectively, the corolla).

pinnate: formed like a feather; compound leaf or frond with leaflets arrayed along an axis.

raceme: a simple unbranched floral structure.

ray flower: the broad asymmetric flowers forming the outer ring of a sunflower head (or all flowers in some cases).

rhizome: a buried stem that provides for efficient vegetative reproduction from axillary buds.

rosette: any organ cluster forming a circle; in case of leaves, cluster is usually at the base.

sepal: part of flower, usually green, that forms a ring surrounding the petals (collectively, the calyx).

sorus: a cluster of spore-bearing structures in ferns (pl. sori).

stolon: a runner, or prostrate stem that spreads horizontally; similar to an above-ground rhizome.

tepal: a collective term used when sepals and petals are similar; common in lily family.

tussock: a compact mass of stems or leaves, usually in graminoids.

umbel: an inflorescence that is shaped like an umbrella; characteristic of celery family, common in many other groups.