



## Appendices

Appendix A: Glossary .....	625
Appendix B: Annotated References .....	642
Appendix C: Supplemental Activities .....	653
Appendix D: Human Chronology .....	661
Appendix E: Arthropods .....	673
Appendix F: Vertebrates .....	688
Appendix G: Plants .....	698
Appendix H: Dichotomous Plant Key .....	701
Appendix I: Activities by Grade .....	703
Appendix J: Activities by Topic .....	705
Appendix K: Standards Correlation .....	711
Alphabetical List of Activities .....	730



# Appendix A: Glossary



*As terms are used in this guide*

- acequia* (ah-SEH-kee-ah) Spanish for “irrigation canal”; in this region refers specifically to the traditional irrigation canals that distribute river water to agricultural fields; this word is derived from Arabic
- acre-foot a volume of water that covers one acre to a depth of one foot; equal to 43,560 cubic feet, 325,851 gallons or 1,233.48 cubic meters
- adaptation a genetically controlled characteristic (anatomical, physiological or behavioral) of an organism that increases its chances of survival and reproduction; also refers to the evolutionary process that creates such a trait
- aggradation the process of building up the riverbed relative to the surrounding floodplain, due to deposition of sediments from the river; the opposite condition, the down-cutting of the riverbed, is called “incision” and occurs when the water picks up sediments from the channel, such as below dams
- agua* (AH-wah) Spanish for “water”; the water of life
- alamo* (AHL-ah-mo) Spanish for “cottonwood”; *alameda* is a grove of cottonwoods
- alkaline material that is basic rather than acidic: having a pH greater than 7.0
- amphibian member of the vertebrate class Amphibia; ectothermic animals with soft, glandular skin that is generally without scales; the name refers to the two-stage life cycle—eggs are typically laid in wet places and the young have gills, while adults develop lungs and can live on land; includes frogs, toads, salamanders and caecilians
- ancón* (ahn-KOHN) Spanish for “oxbow”; an old meander in the river that has been cut off from the main flow of the river
- anomalous deviating from the common or expected condition
- aquatic living in or around the water
- aquatic macro-invertebrates animals without backbones (invertebrates) that live in the water (aquatic) and can be seen without the use of microscopes (macro-)
- aquifer the stratum or rock below ground that bears water, typically in a location capable of producing water usable by humans, such as from a well
- arid describing a climate characterized by dryness, often designated as receiving annual precipitation less than 10 inches (25 cm), or having an evaporation rate higher than precipitation rate; note that “semiarid” refers to a climate where associated ecological conditions are characterized by short grass
- arthropods animals with jointed legs and exoskeletons (skeleton on the outside); group includes insects, spiders, crustaceans, centipedes and millipedes



- ash flow      very small particles of volcanic rock, erupted by some types of volcanoes, that are mixed with gas and travel as a wave or flow along the surface of the Earth
- barbels      whisker-like projections on some fishes
- Berlese  
funnel      a device used to collect arthropods from leaf litter, consisting of a large funnel with screen material covering a narrow opening; leaf litter is placed within the funnel over the screen and a light source is added above, which causes the arthropods to crawl away from the light, down the funnel and into a jar below the screen
- biodiversity    see biological diversity
- biological  
diversity      in considering the ecological condition of an area, biological diversity refers to the variety of organisms present, looking at all levels of classification as well as genetic variability, and the variety of ecosystems in which the organisms occur; also called biodiversity
- biological  
integrity      the wholeness of a system, including the presence of all of the appropriate components and all of the appropriate processes
- biomagnifi-  
cation      the build-up of materials, such as toxins, in one organism after another through the food chain; the top predator ends up with a much larger amount than the plant-eater that may have first ingested it, since the predator has eaten many plant-eaters or many animals that eat the plant-eaters
- biotic  
community    all organisms living on and contributing to a specific region or area
- bird      member of the vertebrate class Aves; endothermic animals characterized by the presence of feathers, forelimbs modified into wings (usually, but not always, used for flying), a bill (beak) lacking teeth, internal fertilization, a calcareous, shelled egg that is incubated outside the body, and various adaptations of the circulatory and respiratory systems that support endothermy
- bosque*      (BOW-skeh) Spanish for “woods” or “forest”; in the Southwest it has been used to describe the cottonwood area adjacent to a river (note on pronunciation: use long “o” as in “bow and arrow,” otherwise you are actually saying the word “bosky” from old English, an adjective meaning wooded; the English poet Robert Burns once wrote a poem titled “The Bosky Bourne” [the wooded creek])
- braided river    a river flowing in several dividing and reuniting channels, separated by sediment deposited by the river
- bravo*      (BRA-voe) Spanish for “wild,” the historic name for the Rio Grande meaning wild, brave, an untamed river; used in this guide to mean



the Rio Grande in its original, unmanaged / unchanged state, before human alteration; vs. *manso*

- breed (v.) to produce offspring; to reproduce
- bud the encased, developing leaf or flower
- bud scales modified leaves that cover and protect terminal and lateral buds and flower buds
- bundle scar spots in the leaf scar where the exchange of water and nutrients between the leaf and the rest of the plant occurred
- caldera large bowl-shaped depression in the top of some types of volcanoes; caused by sagging in of the top during the eruption of the volcano
- cambium a thin layer of tissue between the inner bark and the central wood of a tree; this is the area where growth occurs
- camouflage coloration or pattern to conceal from danger or for predatory advantage
- canopy the uppermost branches of trees forming a continuous cover of leaves at the top of a forest
- capillary bed a zone of soil above the saturated zone (water table) that consists of small spaces containing moisture held by capillary action; capillary action is the attractive force between two unlike molecules, which causes water to draw-up into small spaces between the grains of rock
- carnivore an animal that eats meat (carnivorous); or, a member of the mammalian order Carnivora, including dogs, cats, weasels, bears, etc.
- carrion dead (and typically decaying) animals
- catkin a spike-like cluster of small male or female flowers that lack petals, often wind pollinated; cottonwood flowers are catkins
- cavity a hollow place
- cfs cubic feet per second; the typical unit to record river flows, measuring the amount of water passing a given point; calculated by measuring the width and depth of the channel (area) multiplied by the velocity of the flow (feet per second)
- ciénega* (sea-EN-e-ga) Spanish for “marsh” or “wetland”
- cinder cone a small volcano formed by short-term eruptions of volcanic ash and volcanic rock fragments
- closed basin a drainage surrounded by high land without a natural outlet; surface water does not flow out to a larger river and thus does not reach the ocean
- cobble bars along a river, an area of rounded, coarse stones (larger than pebbles but smaller than boulders) deposited by the river; like a sand bar, but the smaller particles have been scoured away to leave coarser stones
- cohesion the capacity of molecules sticking or adhering together
- cohort a group of individuals of the same age



- colonize to settle or start growing in a new area
- community an association of organisms (plants, animals, microorganisms) that live in and contribute to a particular place or habitat
- competition the interaction between organisms over resources such as food, living space and mates; can either be between organisms of the same species (intraspecific competition) or between organisms of different species (interspecific competition)
- composite
- volcano a large cone-shaped volcano formed by many eruptions of lava and ash over a long period of time
- compound
- eye an eye composed of many individual units called ommatidia, each with a separate lens
- condensation the process by which water changes from a gas to a liquid or solid; the reverse of evaporation
- Continental
- Divide the boundary that separates streams flowing toward the Atlantic or Pacific watersheds; along this divide, water falling within a few feet, such as at a mountain ridge, could flow to different oceans
- crown fire a high-severity fire that reaches up into the forest canopy
- crystal a regular, external shape with many faces (polyhedral) sometimes formed as minerals grow, caused by the internal three-dimensional arrangement of atoms; crystals can grow from solution (such as salt out of evaporating water), by fusion (such as ice crystals formed as water freezes), and from a vapor (such as snowflakes formed in the air)
- data information collected by scientists; facts or figures from which conclusions can be inferred; note that the term “data” is plural (thus it is correct to say “data are”) while the singular is “datum”
- deciduous a plant that sheds all of its leaves in one season
- decompose to break down organic material, done by microorganisms; bacteria and fungi feed on dead plants or animals resulting in simpler substances that plants can use as nutrients
- degradation having a reduced quality or condition; degradation of habitat refers to the reduction of the quality or condition of natural areas that provide habitat (food, water, shelter, space) for living organisms
- delta a deposit of sediment formed at the mouth of a river, either in the ocean or in a lake
- deposition the laying down of sand, silt, clay and rocks by water, wind, volcanoes or landslides; over time, these deposits can become solid rock
- detritivore one who eats small pieces of dead plant, animal or organic matter (detritus)
- detritus small pieces of dead plant, animal, and other organic matter



- dispersal** the act of disseminating or scattering the seeds of plants or the larvae of animals; or any movement of adults away from their place of origin
- discharge** in a stream or river, the rate of flow at a given instant, measured as volume per unit of time; see: cfs
- ditch** channel made by humans to control or use water flow, typically installed higher than surrounding fields
- divide** the line of separation between two drainage basins
- dome volcano** a smoothly rounded volcano formed by the eruption of very sticky magma that is squeezed out of the earth like toothpaste
- drain** a channel cut lower than surrounding farm fields, designed to carry water away from an area where the high water table prevents growth of crops
- earthquake** the trembling of the Earth caused by a sudden movement along a fault, a volcanic eruption, or a human-made vibration or explosion
- earthquake**
- magnitude** a measure of earthquake strength; energy released by an earthquake as determined by measuring equipment
- echolocation** method used by some animals to locate objects by sending out sound waves and hearing the reflection or echo; sonar
- ecology** the study of the relationships between organisms and their environment (*eco* is from the Latin home; *ology* is the study of)
- ecological**
- disturbance** a temporary change in the environmental conditions of an area that cause a notable change in the ecosystem
- ecological**
- succession** typically referring to plant communities, the progression from the initial colonization of an area by organisms to the climax population (the climax community is in equilibrium with current climatic conditions)
- ecosystem** all the living organisms, the non-living components, a source of energy and the interactions among those in a given area; the bosque riparian ecosystem includes the river, the living organisms (bacteria, fungi, plants, animals) and the interactions among them and the non-living processes such as the hydrology and chemical reactions in the system and the input of sunlight energy
- ectothermy** the condition whereby an organism's body temperature is determined by the surrounding ambient (air) temperature (such an organism is called "ectothermic" or an "ectotherm"); the temperature of many ectotherms fluctuates with ambient temperatures, but some ectotherms are able to regulate their temperature behaviorally (such as going into or out of the sun) and thus are able to maintain a more constant temperature
- endothermy** the ability of an organism to produce sufficient metabolic heat to maintain its core body temperature above (or in some situations below) the surrounding ambient (air) temperature (such an organism is called "endothermic" or an "endotherm"); most endotherms can maintain an



approximately constant body temperature, but for some (such as some insects) this may only be possible during periods of activity

endangered in danger of going extinct

energy

pyramid a summary of energy relationships along a food chain; on Earth there are many, many green plants, fewer animals that eat plants and even fewer animals that eat animals, because available energy decreases going up the food chain; cottonwoods and other riparian plants are the base of the pyramid in the bosque

ephemeral seasonal; e.g., a stream or lake only wet part of the year

equilibrium a state of balance due to equal actions of opposing forces, processes, etc.

erosion the movement or wearing-away of sand, silt, rocks, or the land surface itself by water or wind

evaporation the change from liquid or solid to vapor; water in a lake evaporates into the air

evapo-

transpiration a term that includes the portion of precipitation being returned to the atmosphere either by direct evaporation or by transpiration through vegetation, with no differentiation between the two processes being made

exotic species plant or animal brought into an area by humans either accidentally or on purpose; introduced species, non-native species, alien species

extinct species gone forever, none alive anywhere

fast-cooling/

slow-cooling

(magma) as magma cools, minerals are crystallized out of the molten rock; when magma cools slowly the minerals have time to grow very large, when magma cools very quickly the minerals in the solid rock can only be seen with a microscope

fault a break or fracture in the rocks where the earth has moved; a fault scarp is where a fault breaks the surface and causes a cliff or long linear slope

fire

adaptation a characteristic that enhances the ability of an organism to survive fire

fire break a natural or man-made barrier that lack fuel sufficient to maintain a fire

fire

dependence natural communities that are adapted to fire and that rely on fire for maintaining conditions needed by plants and animals in those communities; such a system may be called a fire-dependent ecosystem

fire ecology a branch of ecology that studies the origins of wildland fire and its relationship to the ecosystem





- fire history     how often fires occur in a given geographical location
- fire-independent ecosystem     a system that does not have to have fires at all, either because there is no ignition source or due to lack of vegetation
- fire intensity     a measure of heat generated by a fire
- fire regime     characteristics of fire in a given ecosystem over time, such as frequency, predictability, intensity and seasonality
- fire scar     mark on a tree produced by a layer of charcoal (a burned layer) that is then enveloped by a layer of new growth
- fire-sensitive ecosystem     system that evolved without the influence of repeated fires, in which plants and animals generally lack adaptations to come back after fires
- fire severity     measure of the degree to which a fire alters a given site; can be determined by characteristics such as extent of burn on a tree or amount of leaf litter remaining on the ground
- fire triangle     three elements needed to start and maintain a fire: heat, fuel and oxygen
- fish     member of a large group of finned, aquatic, ectothermic, vertebrates; the group is now classified into three classes of living fishes and one class of extinct, primitive fishes; note that “fish” is the singular form, used for referring to one individual, or a group of individuals if all belong to a single species (e.g., there are 30 fish in that school of silvery minnows), but “fishes” is the correct plural term when referring to members of more than one species (e.g., we saw hundreds of fishes while snorkeling)
- floodplain     in a river valley, the flat area of land on either side of a water channel that is flooded when the channel overflows its banks at flood stages
- flood pulse     a seasonal increase in the volume of water; regular, predictable flooding of a large floodplain river, which produces a lateral exchange between the river and floodplain communities; promotes factors such as nutrient exchange between river and riparian ecosystems, decomposition within riparian zone and fish spawning
- fluctuation     a continual change from one condition to another
- flyway     the path taken by birds during their annual migrations; many birds will take the same route following a river or mountain ridge as landmarks for their journey
- food chain     the connections between organisms in an ecosystem showing what eats what (called a “food web” when you consider multiple interactions among organisms)
- food web     see food chain
- forb     a plant that is herbaceous and not woody and not a grass or grass-like, such as wildflowers



- fresh water an aquatic environment such as streams, rivers, and lakes with little dissolved mineral matter and which results directly from precipitation (rain) rather than salt water (seas and oceans)
- fuel break a natural or man-made barrier that lacks fuel sufficient to maintain a fire
- fuel ladder dry, dead or volatile plants of different heights that carry fire up to the tops of trees, such as fallen trees, branches or exotic plants
- gage a device used for measuring or testing something, especially for measuring a dimension or quantity; in this guide we talk about stream-gages, which collect water data, especially the discharge of a stream or river; note that the spelling “gage” is typically used in technical applications rather than “gauge”
- germinate to begin to grow or sprout
- gills an aquatic respiratory (breathing) organ used for obtaining oxygen from water; characteristic of fish, larval amphibians, some invertebrates
- gradient the degree of inclination
- granite a coarse-grained igneous rock composed mostly of the minerals quartz, feldspar and mica; granite is formed beneath the surface of the earth where it cools slowly from magma
- gravity the force of attraction by which terrestrial bodies tend to fall toward the center of the earth
- ground fire low-severity fire burning on the ground or through the understory and not reaching into the canopy
- ground water water found beneath the surface of the ground, in the saturated zone, where spaces between grains of gravel, sand, silt, clay and cracks in rocks are completely filled with water; the upper surface of the saturated zone is called the “water table”; see aquifer
- habitat the kind of place where an organism usually lives; it includes the arrangement of food, water, shelter and space that is suitable to meet an organism’s needs; think of it as the “address” where an organism lives
- headwaters the upper tributaries of a watershed, where the water first collects and begins to flow as a stream
- herbaceous see forb
- herbivore an animal that eats plants
- hectare a metric unit of area equal to 10,000 square meters or 2.471 acres
- hibernate to enter into a state of hibernation, a physiologic condition experienced by some animals in the winter during which the animal enters a deep sleep, the heart and breathing rates decrease, body temperature decreases, and stored body fat is used for energy
- hydrograph a graph showing the volume of water in a river or stream over time



- hydrology** the science relating to the study of water on earth, in particular aspects such as the occurrence, circulation, distribution and properties of water; can also refer specifically to these characteristics of water
- insect** a member of the arthropod class Insecta; generally characterized by the presence in adults of six legs, three distinct body regions (head, thorax and abdomen), one pair of antennae, and one or two pairs of wings
- insectivore** an animal that eats insects and other small invertebrates (insectivorous); or, a member of the mammalian order Insectivora, including shrews, moles and Old World hedgehogs
- integrity** wholeness; see biological integrity
- introduced**
- species** plant or animal brought into an area by humans either accidentally or on purpose; exotic species, non-native species, alien species
- invasive**
- species** a species non-native (alien, introduced, exotic) to the ecosystem and whose introduction causes or is likely to cause environmental harm or harm to human health; these can be plants, animals or microbes; human actions are the primary means of invasive species introductions
- invertebrates** animals that don't have backbones, such as insects, spiders, isopods, snails
- irrigation** the artificial application of water to land to facilitate the production of crops and livestock; in some situations now, irrigation is used to benefit native riparian plants
- isopods** small arthropods of the subphylum Crustacea (crustaceans) with relatively elongate, flattened bodies with separate segments and 14 legs; isopods breathe through gill-like structures and so must live in water (such as the aquatic Socorro isopods) or in relatively moist terrestrial microhabitats (such as the pillbug or roly-poly); the terrestrial species eat decaying leaves and other vegetation, or the fungus on decaying wood
- Jara willow** (hahdda) Spanish for the brushy kind of willow, like coyote or black willow (note that the single "r" in the center of a Spanish word is like the "tt" or "dd" in "butter" or "ladder"); willow trees with big trunks are "sauces" (sowsehs)
- jetty jack** metal structures that resemble jacks from the children's game, composed of heavy wires and steel angles designed to catch floating logs and debris and trap sediment for two purposes: to stabilize the river channel and to protect the earthen levees from flooding (see sidebar in Chapter 2 for more details)
- keystone**
- species** a species that greatly affects the structure of a community, such that removing the species will cause substantial changes to the composition of that community; keystone species are typically relatively low in biomass but exert strong effects on the overall community in which they live
- landscape** an area of land containing a patchwork of ecosystems



- larva stage of development of a newly hatched animal that is devoted to growth; larva is between the egg and pupa stages in insects with complete metamorphosis, and between egg and adult in other invertebrates or vertebrates such as amphibians (plural=larvae)
- lateral buds the buds growing on the side of the twig; the arrangement can be opposite, alternating or whorled
- lava flow magma that has erupted onto the surface of the earth and flows along the surface like candle wax
- layer in geology, a bed or stratum of rock
- leach to remove nutrients from the soil by percolating water through it
- leaf scar a mark left on a stem after a leaf falls off, indicating where a previous year's leaf was attached to the stem
- lenticels a small opening (pore) found on the stems and roots of higher plants where gases are taken in and released, typically surrounded by a cork layer
- levee a natural or man-made embankment which confines a river to its channel or prevents it from overflowing
- magma molten rock beneath the surface of the earth
- mammal member of the vertebrate class Mammalia; endothermic animals characterized by the presence of hair, milk secretion in females, specialized teeth, a lower jaw made of a single pair of bones, internal fertilization and live birth (in all except Monotremes), and a number of anatomical and physiological adaptations of the circulatory and respiratory systems that support endothermy
- manso* (MAN-so) Spanish for "tamed," as in taming/breaking a horse; used in this guide to refer to the Rio Grande altered by humans through things such as dams and levees; vs. *bravo*
- meander a curve in the channel (path) of a river; the river can curve and move back and forth forming many generations of meander channels; an old meander that is no longer connected to the active river is called an oxbow; as a verb, to move across the floodplain along a sinuous path
- metamor-  
phosis a change in form during the development of an animal; usually refers to insects that must shed to grow; simple metamorphosis: only a slight change at each stage, young are called nymphs (example: grasshopper); complete metamorphosis: larva and adult look completely different from each other and usually feed on different foods and often live in different habitats, intermediate pupal stage is present (example: butterfly)
- migration any cyclical movements (usually annual) during the life of an animal at regular intervals and that always include a return trip to where they began



monsoon

season the period when atmospheric moisture from the Gulf of Mexico moves north, causing dramatic afternoon thunderstorms and heavy rains (more than half of the region's precipitation typically occurs at this time), generally during July and August in New Mexico

mosaic a patchwork of different vegetation types

natural

fires fires that start without the influence of humans, typically by lightning strikes

natural

resources those raw materials supplied by the Earth and its processes, including nutrients, minerals, water, plants, animals, etc.

niche think of it as the "occupation" of an organism; the role of an organism in an ecosystem, such as a "fish-eating wader" for a heron, or a "plant-juice-sipping summer buzzer" for a cicada; an organism's niche may change during different life stages

El Niño /

La Niña refers to unusually wet or dry years, caused by variation in water temperatures and barometric pressures in the eastern Pacific Ocean; in El Niño years, New Mexico has higher than average winter precipitation resulting in high spring flows in the Rio Grande, while La Niña years result in drought conditions in the valley and low water levels in the river

node the point on a stem where one or more leaves are attached or may develop

non-native

species plant or animal brought into an area by humans either accidentally or on purpose; exotic species, introduced species, alien species

*nuevo* (new-AY-vo) Spanish for "new"; used in this guide to refer to a possible Rio Grande of the future, a river actively managed within the levees to simulate Rio Bravo, with a regular flood pulse and supporting high biological diversity

nutrients substances that promote growth and development of an organism

nymph immature state of an insect with simple metamorphosis, in which nymphal stages gradually approach the adult form with each successive molt

omnivore an animal that eats both plants and animals

organic

material referring to or derived from living organisms; those compounds containing carbon

overbank

flooding when water spreads out of the river channel and into surrounding riparian habitats, because there is more water moving down stream than the river channel can hold



- overgrazing    grazing an area beyond the point at which the forage (e.g., grasses) can easily recover
- oxbow            an old bend in a river that has been cut off from the main flow, creating a crescent-shaped pond or small lake; over time as the oxbow dries up, plant communities change to a marsh and eventually a meadow, which may then be colonized by trees
- parasitism      two organisms living together, one benefiting at the expense of the other; an example is a parasitic wasp laying its eggs in a caterpillar, which is consumed by the larval wasps; a special example is of nest parasitism, such as a cowbird laying its eggs in other birds' nests, after which the builder of the nest raises only the cowbird and no young of its own
- permeability    a measure of the ease with which liquids and gases can pass through a rock
- phreatophyte   trees or shrubs with deep roots that tap into ground water; such plants are less affected by limited surface water
- photo-synthesis    the process by which plants use sunlight to change carbon dioxide and water into sugar and oxygen; the oxygen is given off to the air while the sugar makes energy available to the plant and, in the form of complex carbohydrates, contributes to plant structure; this energy is available to other organisms when eaten by them and is the foundation for the energy pyramid
- pillbugs         see isopods
- plague            disease carried by fleas; generally affecting rodents, but the fleas may leave a dead or dying rodent and bite humans, cats or dogs that come close
- pollination      the transfer of pollen from male to female parts of a flower, resulting in the development of seeds
- population      a group of organisms of the same species that live in the same area at the same time
- pore space       the open space between particles in a rock or soil
- porosity         the proportion of empty space in a rock or soil
- precipitation    the discharge of water, in liquid or gas state, out of the atmosphere, e.g. as rain, snow, sleet or hail; the quantity of water thus discharged, measured in the liquid state
- predator         animal that hunts and kills other animals for food
- presa*            (PREH-sah) Spanish for "dam," big and small
- prescribed  
burn/fire        a fire intentionally set under known conditions of fuel, weather and topography to achieve a specific management goal
- prey              an animal hunted or seized as food by a predator
- primary  
consumer        an animal that eats plant material; an herbivore





**producer** organisms able to make organic material (food) using energy from the sun, thus forming the basis of the food chain or web; plants and algae

**pupa** the stage between the larva and adult in insects with complete metamorphosis, typically a non-feeding and inactive stage (plural = pupae)

**range**

**management** the act of overseeing or regulating large open areas (especially with grasses used for forage) where livestock graze

**raptor** any bird of prey; most often refers to diurnal birds of prey such as eagles, hawks or falcons but can also refer to an owl

**real-time data** data available as soon as they are collected, continually sent from the collecting equipment to a central computer through some means such as a dedicated phone line, a radio or a satellite; contrast with data-collection system that uses a device such as an electronic tape or data logger storage unit that requires researchers to travel to the site periodically to manually collect the data.

**reclamation** the act or process of bringing a wild or waste land into a condition for productive use, or repairing an area after activities such as mining; typically “reclamation” refers to modifying an area so that it can be used for cultivation or some other use by people (such as draining a marsh), while “restoration” typically has a goal of restoring an area to its natural condition

**regeneration** the replacement or repair of tissues in an individual (such as resprouting from a damaged stump)

**regulated**

**river** a river whose flow is artificially controlled, particularly by dams and diversions but also by modifications to the structure of the channel

**remanso** (reh-MAHN-so) Spanish for side channel, backwater, quiet water

**reptile** member of the vertebrate class Reptilia; ectothermic animals characterized by thick scaly skin, internal fertilization, and eggs with a parchment-like or calcareous shell that are laid on land; includes turtles, tortoises, tuataras, lizards, snakes, and crocodiles

**reservoir** a lake in which water is stored for use; generally a man-made lake; Cochiti and Elephant Butte lakes are reservoirs

**respiration** breathing, the taking in of oxygen and giving off of carbon dioxide; also refers to the complex process by which animals and plants release energy from fuel molecules (food)

**restoration** the process of restoring an area to its natural condition (or a condition that mimics the natural condition as nearly as possible)

**rift valley** formed by the thinning and spreading-apart of the crust of the Earth, with many faults marking the boundary of the rift; the Rio Grande Rift extends more than 500 miles from Colorado to Mexico; the Rio Grande follows the valley formed by the rift in its journey through New Mexico

**rio** (REE-oh) Spanish for “river”; don’t say “Rio Grande River”—it is redundant



- riparian relating to or living or located on the bank of a natural fresh watercourse such as a river, stream, pond or lake
- riverine on or near the banks of a river; of or pertaining to a river
- rock a clump of naturally-occurring material consisting of many crystals, usually of many different minerals; formed by crystallization from a magma or lava or by deposition of various materials at the surface
- runoff the discharge of water through surface streams; the amount of water (originating as rain or snow) that drains from an area
- sand bar an area of sand built up by currents in a river or by wave action in coastal waters; these can form islands if surrounded by the active river, or may be attached to one bank
- sapling a young tree, generally taller than 4.5 feet (1.5 meters), and less than 4 inches (10 centimeters) in diameter, though these values can be adjusted for smaller trees
- secondary
- consumer an animal that eats other animals; a carnivore
- scat a term used by biologists and naturalists for animal droppings
- sediment sand, silt, clay or rocks that have been worn and broken off (eroded) from other rocks and carried by or deposited by water or wind; along some stretches the Rio Grande carries a large load of sediment that has been eroded from the mountains around the river
- seed a plant reproductive structure consisting of an embryo and stored food surrounded by a protective cover
- seedling a young plant grown from a seed; often refers to a tree that has germinated or sprouted, but has not reached sapling size
- seepage the process of water oozing out of a porous substance, such as the earth
- shield
- volcano a broad, gently sloping volcano that is made up of many eruptions of flowing lava; the shape of the volcano is like a warrior's shield laying on the surface of the earth or like an upside-down flattened bowl
- silt fine earthy material (bits of rock or organic material) carried by water and deposited as a sediment; silting is the process of silt deposition
- sinuous bending, winding or curving
- snag a standing dead tree
- soil
- stabilization management techniques to prevent erosion of soil; these include planting seeds or trees and shrubs (roots of vegetation hold the soil), putting up soil barriers (to hold soil in place), and putting in jetty jacks along the edge of the river (see jetty jacks)
- sonar method used by some animals to locate objects by sending out sound waves and hearing the reflection or echo; echolocation





**species** a unit of classification that refers to a population or series of populations whose members are able to interbreed under natural conditions and do not breed with any other species; for young audiences, an acceptable definition is that a species is a unit of classification that refers to a population (or a group) or a series of populations (or groups) of closely related and similar organisms

**species**

**diversity** a measure of the number of species in a community (species richness) and the relative abundance of each species (species evenness)

**species**

**evenness** the relative abundance of different species in a community or location

**species**

**richness** the number of species in a community or location

**sprout** to start growing from a seed; to germinate

**strata** layers of rock of various types; each rock layer represents a time period and an environment of deposition

**succession** typically referring to plant communities, the progression from the initial colonization of an area by organisms to the climax population (the climax community is in equilibrium with current climatic conditions)

**surface water** water on Earth's surface, including streams, rivers, lakes, wetlands, bays, oceans, as well as solid forms such as snow and ice

**terminal bud** the bud at the end of a twig

**tetones** (te-TONE-ays) the young green (ripening) pods of the female cottonwood

**taxonomy** the science of classification of organisms

**terrestrial** living or growing on land

**thicket** a thick or dense growth of shrubs, bushes, or small trees

**threatened** may become endangered and then go extinct under current circumstances

**topography** surface features of a place, the contours of a landscape large or small

**transparent** material so thin that light passes through, or often that you can see through

**transpiration** the process by which water passes out of plants, primarily through openings in the leaves, and enters the atmosphere; transpiration is a consequence of the structure of the leaf, which must have openings to allow gas exchange for photosynthesis—plants (particularly in arid and semi-arid regions) must balance the need for gas exchange with the need to conserve water; transpiration also provides the transportation system in a giant tree—"transpirational pull" draws water from the roots to carry nutrients throughout the tree



tributary lake	a creek, stream, or river which feeds a larger stream or river or a lake
trilling	making a rapid vibrating sound of at least two different notes
trough	a long linear depression in the surface of the Earth
understory	the area of a forest that grows under the shade of the forest canopy
vertebrates	animals that have backbones, including fishes, amphibians, reptiles, birds, and mammals
volcano	an opening in the Earth's crust from which molten magma, rock, and ash erupt; or, a hill or mountain that forms by the eruption of ash and lava
water budget	a summary that shows the balance in a hydrological system between water supplies (inflow) to the system and water losses (outflow) from the system; a water budget is a common reporting tool for water-resource systems
watershed	an area or region drained by a river, river system or other body of water (drainage basin); also, an area or ridge of land that separates waters flowing into different rivers, basins or seas
water table	the upper surface of saturated ground water
wetland	a transitional zone between dry land and aquatic (water) areas, which stays wet at least part of the year because the water table is at the surface; includes wet meadows, marshes, sloughs, ponds and small lakes
wildfire	a non-structural fire (not in a building), other than a prescribed fire, that occurs in a forest or other wildland area
wildland–urban interface	land close to or within forested area that contains houses and other buildings
wildlife	animals not tamed or domesticated; may be microscopic or large

