

Appendices

Glossary



The Glossary is an alphabetized list of specialized terms and their meanings as they're highlighted and used within the context of the *MinnAqua Leader's Guide* lessons.

Abdomen On an insect, the third body part; contains the digestive tract.

Adaptation A physical characteristic or behavior developed by a plant or animal that makes it better suited to its environment and enables it to survive particular conditions.

Adipose fin A small fleshy structure with no rays or spines; located between the dorsal fin and tail fin.

Aeration system A mechanical device used to add or mix oxygen into the water of a lake or pond.

Agnatha The classification name for jawless fishes; from the Greek words *a* (meaning without) and *gnathos* (jaws).

Algae Any various primitive, chiefly aquatic, one-celled or multicellular plants that lack true stems, roots, and leaves, but usually contain chlorophyll and utilize the process of photosynthesis to turn light energy and nutrients into chemical energy or food energy and release oxygen into the water.

Algae (or algal) bloom A proliferation of algae in a body of water often associated with excess nutrients (particularly phosphorus and nitrogen) in the water column or sediments.

Amphipods A class of small crustaceans; also referred to as scuds or side-swimmers.

Anaerobic The state of being, living, or occurring without oxygen.

Anal fin The fin located on the underside of a fish between the tail and pelvic fins, near the anus or vent. The anal fin provides stability, functioning much the same way as a keel on the bottom of a boat.

Anglers People who fish for sustenance, recreation, or commercial purposes.

Antennae The long, thin, jointed projections from an insect's head that inform it about touch, sound, taste, and odor, as well as the temperature and humidity of the world outside its exoskeleton.

Anti-reverse A feature on a fishing reel that prevents the handle from turning in the reverse direction.

Aquatic Relating to, consisting of, or being in water, such as an aquatic environment.

Aquatic ecosystem Refers to a body of water, such as a stream, river, or lake, and all organisms and nonliving components within it that functions as a natural system.

Aquatic insect A group of macroinvertebrates that have three body parts and six legs and that spend all or most of their life cycles in the water.

Aquatic macroinvertebrate Animals without backbones (invertebrates) that are large enough to be seen with the unaided eye (macro) and spend most or all of their life cycles in water (aquatic).

Aquatic Management Area (AMA) Areas purchased by the DNR with the intent to preserve shoreline and littoral (shallow water) edges of lakes and streams.

Aquatic organism Refers to any living thing that lives in or frequents water.

Aquatic Plant Management (APM) The Minnesota DNR Aquatic Plant Management Program protects native vegetation and the aquatic environment from unnecessary harm while providing for lakeshore owners to control some aquatic vegetation for water access.

Bag limit The total number of a species that an angler may possess. For example, an angler may not possess more than six walleyes, which includes the fish in a live well (the water-filled fish storage compartment on a boat) and in a freezer.

Bail A metal, semicircular arm on an open-face spinning reel that guides the line back on the reel after a cast.

Baitcasting reel This style of fishing reel doesn't have a cover, yet has a push-button to release the line. The line comes off a spool oriented horizontally to the pole.

Balance The state in which an ecosystem is able to sustain itself over time through the interrelationships of its living and nonliving components.

Barbels Sensory structures resembling whiskers that contain many nerve endings, some of which are similar to human taste buds. Barbels help fish find food through the senses of taste and touch.

Behaviors The actions or reactions of an object or organism, usually in relation to the environment.

Benthic Pertaining to the bottom substrate of an aquatic environment.

Benthic organisms Animals and plants dwelling on the bottom of a water body. These organisms inhabit the sediments and other substrates on lake, river, or stream bottoms, as well as bottoms of marshes and other wetlands.

Best Management Practices Methods determined to be effective, practical means of preventing or reducing pollution from nonpoint sources. (See **nonpoint source pollution**.)

Bioaccumulation The gradual accumulation of a substance or chemical in the tissues of a living organism. Some toxic chemicals gradually increase in plants, fish, or people as they breathe contaminated air, drink contaminated water, or eat contaminated food.

Biodiversity The diversity of life on the planet, which includes genetic diversity, species diversity, and habitat diversity. More specifically, it can be described as the total of all the plants, animals (including humans), fungi, and microorganisms, along with their individual variations and interactions.

Biomagnification The process by which the concentration of toxic chemicals increases in each successive link in the food chain.

Bobber A float (made of plastic, wood, or foam) used to keep bait suspended at a specific depth. A bobber is attached to the fishing line and floats on the water's surface above the bait or lure and the sinker (weight). It indicates when a fish nibbles at or takes the bait as it bobs or submerges beneath the surface. (A bobber is also called a float or a cork.)

Buffer zone An area of natural vegetation, adjoining an up-gradient from water bodies, which intercepts and filters surface runoff and subsurface flow from upland sources, removing (or buffering) the effects of runoff and associated nutrients, sediment, organic matter, pesticides, or other pollutants prior to entry into surface waters and groundwater recharge areas.

Butt end On a fishing rod, the base of the rod handle.

Camouflage Coloration and patterns that enable fish and other organisms to blend into their environments, offering protection from predators.

Cane pole For fishing; a bamboo pole or long wooden stick with a length of line tied on the end. A cane pole has no reel.

Carrying capacity The maximum number of individuals or inhabitants that a given environment can support without detrimental effects on the habitat or the organisms.

Casting plug A weighted dummy lure with no hook used to practice casting.

Caudal fin Also called a tail fin, it is located at the back end of the fish and, like a motor, provides the power to propel the fish forward through the water. It also acts as a rudder to assist in steering.

Chondrichthyes The classification or group of jawed fishes with a skeleton made of cartilage. From the Greek words *chondros* (meaning cartilage) and *ichthyes* (fish).

Circle hooks Designed to hook fish in the mouth as soon as the fish bites down and turns to swim away. The point of the hook is turned back towards the shank and may or may not be slightly offset. They're particularly good for beginners, who don't then have to "set the hook" by jerking the line. They're self-setting. Fish hooked in the mouth (not the throat or stomach) have a better chance of surviving during catch-and-release.

Classification Systematic methods of naming, and grouping like organisms according to shared features or characteristics.

Clip-on depth finder A lead weight on a spring-clip used to set the depth of the bobber. Typically used for ice fishing.

Closed-face reel A fishing reel that sits on top of the rod and has a push-button for releasing the line. Closed-face reels have a cover over the spool that holds the line and are sometimes called push-button or spin-cast reels.

Cold-blooded Animals, such as fish and amphibians, that require the sun's warmth for heat and have an internal body temperature that varies according to the temperature of their surroundings.

Complete metamorphosis The process of development in which the immature form of an organism looks and behaves differently from the adult; the stages of development are egg, larva, pupa, and adult.

Compromise A group decision in which one or all parties may need to sacrifice some wants or needs in order to reach group consensus or a decision.

Concerned citizen group An organized group of people with similar perspectives and values regarding an issue.

Condensation When cooling temperatures cause water vapor to change states from a gas to a liquid and form droplets, or from a gas to a solid (as in forming snow flakes).

Conglutinate A gelatinous case containing numerous developing mussel larvae or glochidia. (See **glochidia**).

Consensus When several groups or individuals with differing perspectives and ideas agree on how to proceed with a decision.

Conservation Management of the human use of the biosphere so that it can yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. It includes the preservation, maintenance, sustainable utilization, restoration, and enhancement of the environment.

Conservation officer Licensed peace officer trained in conservation regulations.

Consumer An organism that obtains its food energy for growth, metabolism, reproduction, and other functions by eating other plants and animals.

Control group A standard or untreated group against which other conditions or variables can be compared in order to validate the results of the study or scientific experiment.

Cover A shelter for resting and protection from environmental elements and predators: one of the four basic habitat needs of most living organisms (food, water/oxygen, cover, and space). Or a fixture over the interior gears and spool of line on a closed-faced fishing reel.

Crankbait Artificial bait or lure that imitates baitfish and has “lips” that cause it to dive and wiggle. Crankbait is useful for attracting larger predator fish that swim in deeper areas such as northern pike, muskellunge, walleye, bass, and salmon.

Creel survey Survey that collects data, through an interview process at lake access sites, regarding the fish that anglers catch. Creel surveys are also conducted on the lake or river, boat to boat.

Crucial habitat Habitat essential to maintaining viable populations of fish and wildlife during certain seasons of the year, specific reproduction periods, or periods of a life cycle.

Culling An illegal practice by which a smaller fish of a given species (in a live well or on a stringer) is replaced by a larger one caught later in the day.

Current The rate of fluid flow, especially water in a river or ocean. A current can be any continuous, directed movement of a fluid of various speeds.

Cut-bank The outside curve of a bend or meander in a stream that is scoured by the faster and more direct impact of the moving water removing sediment, sand, and other materials composing the bank. Hollows in the outer bank may result. Water not only flows faster along the outer bend, but also flows more directly and forcefully into the outer bend as it flows through a curve in a stream or river.

Cycle A series of natural events repeating continuously, or involving a complete process of growth or action.

Daily limit The total number of a certain species or combination of species that an angler may take in one day.

Decomposer Organisms that consume dead organisms breaking them down into simpler forms of matter.

Dehydration A dangerous condition caused by the loss of too much water from the body through sweating, vomiting, and so forth, or resulting from the inadequate intake of water.

Depth perception The ability to judge the relative distance of objects and the spatial relationship of objects at different distances.

Designated use All lakes and rivers in Minnesota have a recognized or assigned use, and each designation has a specific set of water quality standards. The seven classifications are: aquatic, fish, and wildlife; recreation; industrial; limited resource value; domestic water supply; agricultural; or navigational. A water body may have several designated uses.

Diapause A suspended state in which an organism exhibits an extremely slow heart rate; a behavioral adaptation that helps an organism survive a seasonal or limited period of extreme or harsh environmental conditions.

Dichotomous key An identification tool, used to determine the identity of an organism that involves answering a series of either/or questions or yes or no questions regarding physical characteristics.

Disruptive coloration Coloring, consisting of spots, stripes, or mottled patterns, that blur an animal's outline and allow it to blend into the background colors and textures of its surroundings.

Dissolved oxygen Oxygen gas dissolved in water.

Diversity The distribution and abundance of plant and animal species within a given area.

Dormant A state in which plants or animals slow growth, reduce metabolism, and reach a state of biological rest or inactivity in which they're able to wait until environmental conditions are more favorable to resume normal activity.

Dorsal A Latin word describing the back side or top side of an organism.

Dorsal fin The fin located along a fish's back between its head and tail. It may be a single fin, with or without spines, or consist of two connected or unconnected parts, a sharp-spined part and a soft-rayed part. It provides stability and allows the fish to remain upright in the water.

Dough ball Flavors puréed and mixed with flour (which acts as a flavor carrier) and formed into balls that can be placed on a hook.

Drag The amount of tension on the line as it comes out of the reel.

Dry fly An artificial lure that floats on the surface of the water and imitates an insect that has just emerged from the water in its transformation to an adult, or an adult that has just landed on the water to lay its eggs.

Economics The study of how to use limited resources and the production and distribution of goods and services to satisfy humankind's needs and wants as fully as possible; the study of supply and demand in the allocation of limited resources.

Ecosystem A complex and self-sustaining natural system involving the interactions between the living organisms and non-living world. Humans are part of the ecosystems where they live and are interconnected with the living and non-living parts of the system.

Ecosystem-based management A method of natural resources management that recognizes the environment and ecological systems as well as the importance of the human community and its economy.

Eddy Pocket of slower water behind structures such as rocks or debris in a stream or river. An eddy provides cover or a good resting spot and a good place for fish to hide prior to darting out and grabbing passing prey from the currents.

Electrofishing An active fish sampling technique that uses an electrical charge to temporarily stun fish and cause them to float to the surface, where they're captured with nets.

Electrofishing equipment Equipment used in the water that employs an electrical charge to temporarily stun fish so they can be collected, measured, and weighed. Fish quickly recover and are released unharmed.

Embryo Fertilized egg.

Emerge As applied to plants and animals, to come out of dormancy (stimulated by favorable environmental conditions) and return to a fully active state in the spring.

Emergent plants Plants attached to the lake, river, or stream bottom; they have true stems, roots, and leaves with more than half of their vegetative parts sticking out of the water.

Emigrate To leave an area; emigration decreases the size of the population in a given area.

Erosion The gradual wearing away of soil and rock surfaces by natural forces, such as flowing water, wind, and ice, or by human and animal activities that disturb the soil and vegetation holding the soil in place.

Estimate To use a statistical method to roughly calculate the approximate number of something such as fish in a body of water.

Eutrophic The condition of lakes or ponds whose waters are rich in mineral and organic nutrients. This promotes a proliferation of plant life, particularly algae, which can, in excessive quantities, lead to reduced levels of dissolved oxygen and kill other aquatic organisms, including fish. Derived from the Greek words *eutrophos* (meaning well-nourished), *eu*, and *trephei* (to nourish).

Evaporate When water changes states from a liquid to a gas and energized molecules disperse into the atmosphere at temperatures below the boiling point. Amount of surface area exposed, ambient humidity, and temperature influence the rate of evaporation.

Exaggeration When an object, event, or characteristic is overstated, enlarged, or represented as larger than life.

Exoskeleton A hard, shell-like structure on the outside of an organism (exterior skeleton), such as an insect or crustacean, that provides protection and support for its body.

Extinction Occurs when an entire species cannot adapt to changes in its environment and every member of that species dies.

Facultative Describes semi-tolerant organisms (such as dragonfly and damselfly nymphs) that prefer good stream quality, but can survive in semi-polluted conditions.

Fingerling A developmental stage in the life cycle of a young fish, before it matures into an adult; a fish approximately four inches long—approximately the length of an adult person's index finger.

Fingerling stocking A fisheries management practice involving the addition of four- to six-inch fish to manage or increase the population of a certain species of fish in a water body.

Fish advisory A report that provides guidelines on how much fish people can safely consume while minimizing their risks from contaminants.

Fish passage Water-filled canals, ladders, or staircases that enable fish to bypass or circumvent dams and other constructed obstacles.

Fishes/fish The term fishes is used when referring to more than one species of fish. Fish refers to one or more than one individual of the same species.

Fishing regulations The laws that govern fishing in the state and are designed to maintain healthy fish populations.

Flies Small, lightweight lures typically associated with fly fishing.

Floating-leaf plants Aquatic plants rooted to the bottom of a water body, with leaves that drift and float on the surface of the water.

Fly fishing reel The reel used on a fly fishing rod; not used in casting and used only to store the line.

- Folklore** The creative expression of a particular group of people in which their traditions and beliefs are incorporated into stories in innovative ways.
- Food chain** A sequence, of typically not more than four steps, through which the process of energy transfer occurs in an ecosystem beginning with photosynthesis in plants and continuing successively as one organism consumes another.
- Food web** A diagram of a complex, interacting set of food chains in an ecosystem.
- Forked tail** Term used to describe a caudal fin with a notable notch. (See **caudal fin**.)
- Form** As pertaining to fish, the shape of a fish's body and body parts in relation to their functions.
- Free-floating plants** Aquatic plants not attached to the bottom that float on the surface.
- Fry** Newly-hatched fish.
- Fry stocking** A fisheries management practice involving the addition of newly hatched fish (less than one-quarter inch long) to manage or increase the population of a certain species of fish in a water body.
- Function** How a part works.
- Gill chamber** In fish, cavities with external openings, protected by the gill cover, or operculum, located just behind the head on each side of the body where the gills are located.
- Gill nets** A loosely set and almost invisible wall of fine netting (mono- or multi-filament nylon), usually 250 feet long, that traps fish by their gill cover(s). These nets are used to capture walleyes, northern pike, whitefish, and yellow perch. Some fish may become entangled and die in gill nets. Gill nets are used in some types of fish surveys.
- Gill opening** The opening at the rear of a fish's head from the gill chamber to the exterior. Most fish have one on each side.
- Glochidia** A larval developmental stage of mussels. Glochidia mimic insects to entice fish to ingest them—the fish hosts them for a stage of their development. (See **conglutinate, mussel, and veliger**.)
- Gorge-hook** A bone shaped to act like a toggle used to catch fish or waterfowl. When swallowed, it will catch in the stomach of the prey and can't be withdrawn.
- Grip** The portion of a fishing rod used to hold the rod (handle).
- Groundwater** The water existing within cracks and porous materials in the aquifer (underground).
- Gyotaku** The Japanese art form of fish printing, originally developed by fishermen in the mid-1800s to record details of their catches.
- Habitat** An area that meets the survival needs of many organisms by providing food, water, cover, and space.
- Habitat needs** The basic things an organism needs to survive where it lives: including food, water (in aquatic ecosystems, water also provides dissolved oxygen for respiration), cover (shelter), and space.
- Hand auger** A sharp, corkscrew-shaped tool used for drilling holes in ice by hand, usually for ice fishing.
- Harvest slot limit** A size range in which fish may be kept. For example, a fourteen- to eighteen-inch harvest slot means that only fish between fourteen and eighteen inches may be kept. All others must be released.
- Hibernation** A survival strategy for spending part or all of the cold season in a basically dormant state of inactivity brought about by short daylight hours, cold temperatures, and limited food.

Hook An implement that catches the fish by holding bait and piercing the lip of the fish.

Hook size The numbers that define hook sizes can be confusing, but the system is actually fairly simple. Hook sizes are based on an arbitrarily set standard hook size of zero. Hook sizes with a number followed by a zero increase in size as the number goes up. For instance, a 4/0 (“four aught”) hook is one size up from a 3/0, which is one size up from a 2/0, etc. Hook sizes not followed by a zero decrease in size as the number increases. For example a size 6 hook is smaller than a size 2 hook, which is smaller than a size 1 hook. Although almost all hook manufacturers follow this basic numbering system to indicate the increase or decrease in size of each hook within an individual pattern, there is, unfortunately, little standardization in overall size.

Hyperbole A figure of speech in which the use of exaggeration is intended for emphasis or effect, as in “I’ve been waiting for all eternity!”

Hypothermia A potentially fatal condition that occurs when the body loses heat faster than it can produce it.

Ice scoop A ladle-type tool with small drain holes that is used for scooping ice chips from a hole in the ice.

Ichthyologist A scientist who studies fish.

Identification key A tool used to unlock the identity of plants and animals requiring careful observation of the specimens.

Imprint A fish’s memorization of the unique odors of its home spawning site.

Improved clinch knot A knot that is used for securing fishing line to a fishing lure.

Incomplete metamorphosis A type of insect life cycle wherein an insect hatches from an egg and acquires adult features and behaviors gradually through a series of molts; typically, there is no inactive, non-feeding pupa stage. The stages of development are egg, larva/nymph, and adult.

Indicator species An organism that can provide information about the conditions and quality of the environment where it lives.

Intolerant An organism that is sensitive to pollutants and is incapable of developing and growing normally in degraded conditions.

Invasive species Species or types of organisms introduced—intentionally or accidentally—into places where they’re not native and did not originally occur, and adversely affect the habitats they invade environmentally, ecologically, or economically.

Jig Lure resembling natural fish food such as insects and small fish. A jig has a weighted “head” and a “tail” that can be purchased separately. These types of lures are called jigs because they are typically fished by bouncing, or jiggling, them along the bottom of a water body to attract fish.

Jiggling rod and reel A style of ice fishing pole with a reel that holds the line, but has no drag, so the line comes out freely.

Jiggle stick An ice fishing stick or pole with no reel; instead the line is wrapped around two pegs inserted into the pole near the grip. When ice fishing the short stick is jiggled intermittently to wiggle the lure or bait to attract fish. (See **grip**.)

Knowledge bowl Sometimes called an academic bowl or quiz bowl; a fun and fast-paced game in which students compete in teams to answer questions on topics they’ve studied in class.

- Lake Finder** Located on the Minnesota DNR website, the Lake Finder is an interactive website for the public that contains research data for more than 4,500 lakes throughout Minnesota.
- Lake survey** A resource management tool to sample plant and fish populations in a lake using trap nets, gill nets, seines, and aquatic plant surveys, as well as testing water clarity and chemistry and monitoring wildlife habitat to acquire sound information for a variety of aquatic and fisheries management purposes.
- Land use** The way land is developed and used in terms of the types of activities permitted (such as forestry, agriculture, urban, recreation, and industry).
- Larva** The immature stage of development of an organism before change of form or color (or metamorphosis) takes place and the organism becomes an adult.
- Larvae** The plural of larva.
- Lateral line** Unique sensory mechanism that enables fish to feel vibrations in the water. It's often called the sixth sense of a fish, but is actually an extension of the fish's hearing.
- Lengthwise stripes** Color patterns or stripes that run from the nose to the tail of a fish.
- Lie-in-wait predators** Northern pike, muskellunge, gar, and other fish exhibiting a particular type of predatory behavior. Instead of cruising around and looking for prey, they lie still on the bottom, mimicking a stick or log, or remain hidden in cover. They capture their unsuspecting prey by surprise, with a sudden burst of speed.
- Life cycle** The progression through different stages of development from egg to reproductive adult.
- Light quality** Different colors or wavelengths of light within the light spectrum.
- Light quantity** The brightness or intensity of light that is transmitted or absorbed through water.
- Light spectrum** The visible range of light that can be seen by the human eye. It's made up of electromagnetic radiation in wavelengths from approximately 380nm (violet) to approximately 700nm (red).
- Limit** See **daily limit** and **possession limit**.
- Limited resource** Something produced by or found in nature that is used by people. Only a finite amount is available and more cannot be made.
- Limiting factor** A condition that influences the survival of an organism, population, or species.
- Limiting resource** The amount and quality of food, water, cover, and space available that determines how big an individual organism can grow, which species can survive in a particular habitat, and how many organisms of a particular species can live in the habitat (population size).
- Limnetic zone** The open surface water above the deep area in a lake where rooted plants can't grow (typically deeper than fifteen feet), surrounded by the littoral zone.
- Line guides** Small circles of steel with a ceramic coating located along the length of a fishing rod; they keep the line in place so it is less likely to tangle during a cast.
- Line opening** Place where the line comes out of the cover of a closed-face reel.
- Littoral zone** The shallower portion of a lake, usually less than fifteen feet deep, where sunlight can penetrate to the bottom with enough intensity for rooted aquatic plants to grow.
- Low-head dam** A small, relatively inexpensive concrete structure used to control water levels at the outlet of a lake or a stretch of river.

Lunker structure Box frames placed in the water along the edges of streams that provide cover where fish can hide from predators and grow larger.

Lure Artificial bait used to attract fish.

Macroinvertebrate Organism lacking an internal skeleton and large enough to be seen with the unaided eye—an integral part of wetland and stream ecosystems.

Macrophytes Aquatic plants large enough to be seen by the unaided eye (without a magnifying lens or microscope).

Main character In a tall tale, the main character is a heroic figure that solves a problem in an amazing way.

Mark-recapture A fish survey method that involves tagging or otherwise marking an initial number of fish and releasing them back into the general population. A subsequent sampling is taken and numbers of marked fish are compared to numbers of unmarked fish in the sample to statistically estimate population size and population vital rates such as survival, movement, and growth.

Maximum size limit A limit requiring all fish larger than a set length to be released. A 24-inch maximum size limit for northern pike means an angler may not keep a northern longer than 24 inches.

Meander Term used to describe the curve of a stream or river.

Mercury A naturally-occurring metal that poses health risks to humans and other animals; most of the mercury that enters Minnesota waters comes from burning coal and other fossil fuels, but is also released from wastes containing household and industrial mercury.

Mesotrophic Lakes containing moderate quantities of nutrients, which are moderately productive in terms of aquatic animal and plant life.

Metamorphosis A striking or abrupt change (or series of changes) in the physical form of an animal, such as insect, that occurs during its life cycle after hatching (or birth), as it develops into an adult.

Metaphor A metaphor is a figure of speech in which a word or phrase that ordinarily refers to one thing is used to describe another object or idea, such as “He’s drowning in money,” or “Her eyes are deep, blue pools.”

Microclimates Term used to describe climates within a small, defined area, possibly different from the area directly surrounding it.

Migrate/migration The annual or seasonal movement of an organism from one habitat to another; typically involves a return trip to the original habitat.

Minimum size limit A limit requiring that all fish smaller than a set length be released. For example, the statewide minimum size limit for muskellunge is 40 inches, meaning that one must release muskies shorter than 40 inches.

Mollusk An invertebrate animal with a soft, unsegmented body, usually enclosed in a shell.

Molting The act of outgrowing, shedding, and replacing the exoskeleton of an invertebrate.

Monitor To observe, check, and test.

Native A species that has lived in a particular region for thousands of years, and, as such, has coevolved with its associates (other animals, plants, fungi, and bacteria). It’s not enough for the species to have reproduced in the area for a few generations unaided by humans—these species are described as naturalized, but not native.

Nitrogen A naturally-occurring element necessary for plant and algae growth.

Nonpoint source pollution Pollution emanating from sources not easily identified; occurs when runoff or wind picks up and disperses or carries natural or manmade pollutants.

Nostrils Fish usually have two openings on either side of their snouts that facilitate sense of smell. Also called nares.

Nutrient cycle A set of processes recycling nutrients from their simple mineral states in the atmosphere, soil, and water to plants and from one organism to another and back to the atmosphere, soil, and water in an ecosystem.

Nymph A larva of an insect that undergoes incomplete metamorphosis (such as a dragonfly or a mayfly).

Nymph pattern A type of design or pattern used when tying flies (small lightweight artificial lures) to result in a fly that mimics the larval forms of an aquatic insects, particularly mayflies, stoneflies, and caddisflies.

Oligotrophic Scantly nourished lakes that are very low in nutrients; minimal algae grow and the water is very clear. Lake Superior is Minnesota's best example.

Omega-3s A group of polyunsaturated (good) fats found in foods such as flaxseed, walnuts, canola oil, and fish native to cold waters, such as salmon and trout. They're important components of cell membranes, particularly in the brain and eyes.

One-over limit A limit allowing anglers to keep one fish over a set length.

Open season The time of the year anglers may fish for a certain species, or type, of fish.

Open-face reel A style of fishing reel that has no cover, also called a spinning reel. The spool of line is oriented perpendicular to the rod.

Osteichthyes The classification or group of jawed fishes with skeletons made of bone. Also referred to as bony fish, coming from the Greek words *osteon* (meaning bone) and *ichthyes* (fish).

Over-winter Technique in which an organism addresses the challenges of winter and survives throughout the winter months.

Palate The roof of the mouth in humans and other vertebrate animals. Often refers to the sense of taste.

PCBs Polychlorinated biphenyls. These toxic synthetic oils once had many industrial uses and are still found in electrical transformers, cutting oils, and carbonless paper.

Pectoral fins Fins located on either side of the fish near the gills that help the fish steer, stop, and stay near lake or river bottoms. Pectoral fins also help provide lift, like wings on an aircraft.

Pelvic fins Fins located on the bottom of fish, in front of the anal fin, that help balance the fish, keep it level, and prevent it from rolling to one side or the other.

Percolation The movement of precipitation that has fallen to earth as it seeps directly into the soil.

Periphyton Algae that grows attached to surfaces such as rocks or larger plants at the bottom of lakes and other bodies of water.

PFD Personal flotation device.

Phosphorus A naturally-occurring element necessary for plant and algae growth.

Photosynthesis A process by which green plants and algae use light energy captured from the sun by chlorophyll to turn carbon dioxide and water into simple carbohydrates (food energy) and oxygen.

Physical characteristics Observable features of an object or organism, such as shape, form, color, size, and texture, as opposed to behavioral characteristics.

Phytoplankton Microscopic plants and bacteria that produce food energy by capturing light energy directly from sun light with chlorophyll through the process of photosynthesis.

Pier Floating wooden structure used for fishing.

Piscatorial A derivative of a Latin word (*Pisces*) meaning fish.

Plankton Tiny microscopic organisms (plants and animals) that usually live suspended in the water and are eaten by fish and other aquatic life and form the base of aquatic food chains.

Poaching The harvest of more fish or game than the law allows, or the taking fish or game by illegal means.

Pollution Anything that alters or makes water, air, or soil harmful, less desirable, or less useful for plants and animals, including people.

Pool An area of slower, deeper water in a river or stream, typically downstream of riffles.

Population The collection of organisms of a particular species living in a given geographic area.

Possession limit The total number of a species that an angler may legally possess. For example, an angler may not possess more than six walleyes, including fish in both a live well (the water-filled fish storage compartment on a boat) and in a freezer.

Precipitation The phenomenon by which water droplets in the atmosphere become heavy enough to be pulled by gravity to the earth, in the form of rain, sleet, or snow.

Predator An animal that hunts and captures other animals for food.

Preservation Complete protection of a resource or ecosystem allowing for little human disturbance.

Prey An animal consumed by a predator.

Primary consumer An animal that eats only plants (or phytoplankton).

Producers Plants (including phytoplankton) that can produce sugars (food energy) directly from the sun's light energy and simple nutrients through the process of photosynthesis.

Profundal zone The zone that lies beneath the limnetic zone and extends to the bottom of the lake.

Proportion In mathematics, an equation that states equality between two ratios.

Protected slot limit A size range, or slot, in which fish must be released. For example, a twelve- to sixteen-inch slot limit for bass means that all bass between twelve and sixteen inches long must be released.

Public access Areas on lakes or other bodies of water where boats may be carried in or launched by trailer enabling public access to the water.

Public land use hearing An open forum or meeting in which different groups can have their opinions about development or use of land in the community heard and considered.

Pupa A developmental stage of many insects, intermediate between the larva and the adult; this stage is generally inactive and encased in a case or cocoon.

Random spawners Fish that scatter their eggs randomly over their preferred spawning habitat (such as on gravel or cobble).

Ratio In mathematics, a comparison expressed as a fraction.

- Rattle reel** A free-spinning ice fishing reel that makes noise when a fish pulls on the line attached to the reel, often attached to the wall of an ice fishing house.
- Rays** Fin supports; they're almost always soft and flexible, and often branched.
- Recapture** Previously tagged or marked fish that are caught again.
- Redd** A depression created by members of the salmon/trout family; these fish use their tails to fan away finer sediments to create a space in which females deposit and males fertilize their eggs (spawn).
- Reel handle** The crank on a fishing reel used to wind in the line.
- Reel seat** The part of the reel that is mounted onto the rod, also called a reel foot.
- Regulations** Legal restrictions formally made public by government authority. See fishing regulations.
- Researcher bias** A situation occurring when a researcher knowingly or unknowingly influences the results of an experiment due to personal viewpoint or individual technique.
- Respect** To show special attention, concern, consideration, or thoughtfulness for something; to hold in high regard or esteem
- Respiration** The physical and chemical process of supplying the cells and tissues of an organism with oxygen for the processes of metabolism and releasing carbon dioxide.
- Responsibility** Accountability, reliability, and trustworthiness.
- Ridgelines** The highest elevation levels in an area.
- Riffle** Shallow area in a stream where the water moves quickly over rocks and is distributed from one bank to another.
- Riparian habitat** The green corridor of native trees, shrubs, and grasses that grow along lakes, rivers, ponds, or streams.
- Rod tip** A term used to describe the end of a fishing rod held furthest from the angler during casting and fishing.
- Rounded tail** Describes a caudal fin without a notch. (See **caudal fin**.)
- Rover-predators** Fish that spend much of their time cruising and searching for prey. Rover-predators include bass, many minnows, and trout.
- Run** When fish migrate or travel to another location to spawn.
- Sac fry** A newly-hatched fish with a full yolk sac containing proteins attached to its belly.
- Sample** A representative number of fish taken from a lake; used to make inferences about the entire population.
- School** A group of the same type of fish swimming together.
- Secchi disk** A simple tool used to determine water clarity (transparency).
- Secondary consumers** Animals that eat other animals (carnivores or omnivores).
- Sediment** Erosion from the watershed (silt, sand, and organic and inorganic material) that accumulates on lake, river, and stream bottoms.
- Sedimentation** The deposition or settling of soil particles suspended in water.
- Seines** Small-meshed nets used to capture small and young fish. Seines are attached to a pole on each end and are typically used by wading in from shore.
- Senses** Biological processes that help organisms perceive their surroundings and survive in their environments.

Sensitive Describes species that are intolerant to pollutants that can survive only within a narrow range of environmental conditions; a sensitive species' disappearance from an area is an indication of pollution or other environmental change.

Setting The time, place, and circumstances in which a story takes place.

Severe thunderstorm warning Statement issued by the National Weather Service when a thunderstorm is occurring in an area.

Severe thunderstorm watch Statement issued by the National Weather Service when a thunderstorm is possible in an area.

Simile A figure of speech in which two dissimilar things are compared, usually using the words like or as: "Mary swims like a fish," or "I'm as busy as a bee."

Sinker A weight attached to a line so to make it sink into the water.

Snagged Term describing the state of a fishing line caught on a branch or elsewhere above or below the water's surface.

Snags Dead trees submerged in the water; snags provide cover and habitat for fish.

Spawn The process by which fish reproduce. Females release eggs, which are subsequently fertilized by milt (fluid containing sperm) from males.

Spawning Active process of laying and fertilizing eggs.

Species A group of like individuals able to breed and produce fertile offspring. Species is also the classification category that follows the genus or subgenus grouping in the biological classification system.

SPF Sun protection factor.

Spines True fin spines are derived from the soft rays; they're unjointed and of a single structure, can be sharp and bony.

Spinner A lure that has one or more blades that spin around a metal shaft.

Spinning combo A fishing rod with a spinning reel (or open-face reel) that holds the line and has drag, so it can be set to prevent the line from coming out freely.

Spiracles The openings in the sides of an insect's abdomen through which it breathes.

Split shot sinker Small weights with a split down the center to attach to a line.

Spoon One large heavy blade that wobbles through the water like a baitfish. Typically one side is shiny silver or gold, the other side painted bright colors.

Sportsmanship As exhibited by anglers, common courtesy for others, respect for the regulations, the fish, and water resources, as well as a sense of stewardship for natural resources.

Stewardship The careful and responsible management of something entrusted to one's care.

Stinkbait Highly aromatic baits prepared by anglers and usually used to catch catfish. (See **dough balls**.)

Stream Habitat Program Program that gathers and provides information on Minnesota's 90,000 miles of rivers and streams, helping to protect and restore them.

- Stringer** A device made of cotton, polyester, or wire that is put through a fish's lip or gills in order to prevent it from swimming away while being held in the water to keep it fresh.
- Structure** Any lump, bump, hole, or hideaway in a lake or streambed that can provide cover or shelter for a fish. Structure also includes rocks, plant beds, stumps, logs, piers, drop-offs, and "points" of shallow water extending into deeper water.
- Submerged plants** Aquatic plants with roots, stems, and leaves that grow entirely underwater, although some may also have floating leaves.
- Substrate** Bottom materials such as rocks, gravel, or muck.
- Surface runoff** Precipitation and melt water that flows over the surface of the land directly into streams, lakes, and rivers.
- Survey** To gather long-term information on population size and structure (such as the proportion of fish in age or length groups), fish growth, reproductive success, species abundance, fishing pressure and harvest rates, seasonal fish movement or migration, and habitat conditions (including plants, plankton, and invertebrates).
- Suspended sediment** Sediment floating in the water column; makes the water appear muddy or cloudy.
- Sustainable use of natural resources** Using natural resources in a way that meets the needs and aspirations of the present generation without compromising the ability of the environment to meet the needs and aspirations of future generations.
- Swim-up fry** A stage of development in the life cycle of a fish. After hatching, and after its yolk sac is absorbed (see **sac fry**), the fish is free to "swim up" to the surface to fill its air bladders and begin feeding.
- Tag** To mark or identify individual fish by giving each fish its own number or code so that it can be tracked over time.
- Tag end** The loose end of the fishing line or rope with nothing attached to it.
- Tall tale** Stories that are outrageously exaggerated or larger than life, usually told in a straightforward, believable style.
- Taxonomy** A branch of biology concerned with classifying and naming the diverse forms of life.
- Theme** The plan, scheme, or main point of a story.
- Thorax** The portion of an insect's body directly behind the head to which its wings and legs are attached.
- Throwable PFD** A personal flotation device attached to a rope; can be thrown to an angler who has fallen into water or through the ice.
- Thumb button** Mechanism on a closed-face fishing reel that releases the line when the button is depressed and then released.
- Tip-up** A disc- or cross-shaped ice fishing rig that sits over a hole in the ice. When a fish takes the bait, a lever releases a flag to alert the angler.
- Tolerant** Describes organisms with special features, behaviors, or adaptations that enable them to survive in polluted or degraded environmental conditions.
- Transpiration** In plants, the process whereby water reaches the leaves, is exposed to the air and the sun's energy, and is easily released into the atmosphere in a gaseous state.
- Trap nets** Small nets used to capture bluegills, bullheads, and other near-shore species for fish surveys. Live fish can be released from trap nets unharmed.

Trawls Small-meshed nets that are towed behind a boat and used to capture young fish.

Trotlines A series of baited hooks strung along a rope. This tool is used to survey catfish and other species that often can't be effectively captured by other means.

Turbidity The amount of solid particles suspended in water that cause light rays shining through the water to scatter. Turbidity makes the water cloudy, or even opaque, in extreme cases.

Undercut Small caves or hollowed out areas in the banks of streams and rivers.

User groups Groups of people that use resources in varying ways and could have divergent values and perspectives on land use.

Value To rate the relative importance or monetary worth of a thing; to rate or scale its usefulness. Things considered important, beneficial, or useful are said to have value.

Veliger Free-swimming larva produced by zebra mussels.

Vent Sometimes referred to as anus, the opening on the ventral (underbelly) side of a fish near its tail, through which waste is eliminated.

Ventral The underside or underbelly of an organism.

Vertebrate Anatomical term used to describe animals with backbones or spines.

Vertical stripes Stripes that run up and down from the dorsal side to the ventral side of a fish.

Warm-blooded Organisms that produce body heat and regulate body temperature from within their bodies using energy from the food they eat. Warm-blooded animals maintain a relatively constant body temperature independent of the outside temperature.

Water analysis Chemical and physical tests undertaken to determine quantities of materials such as dissolved oxygen, nitrates, and phosphorus, as well as water clarity.

Water cycle Describes the continuous movement of water on, above, and below the surface of the Earth.

Water pollution Contamination that makes water aesthetically unpleasant, less useful, or potentially toxic to plants and animals, including people and fish.

Watershed An area of land that catches precipitation (rain, sleet, and snow) and drains into a body of water such as a wetland, stream, river, lake, or groundwater.

Wavelength Refers to the distance between two successive points of an electromagnetic waveform, usually measured in nanometers (nm).

Wet fly Fishing lures typically used in fly fishing made from materials that absorb water and imitate drowning or struggling adult insects and insect larvae.

Winterkill When fish under ice cover die due to lack of oxygen during winter.

Xylem Anatomical term describing a plant's vessels or tubes that conduct water and dissolved minerals, store food, and provide support.

Year class A term describing each year's new generation of fish.

Zebra mussel Invasive (or non-native) clams, shorter than two inches across that, by means of tufts of fiber (abyssal threads) attach themselves to any solid object. Their shells have dark "zebra" stripes and very sharp edges.

Zooplankton Microscopic aquatic animals.