

# PREDATOR GLOSSARY

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**Apex predator** – A top predator; a predator at the top of its food chain. Wolves, jaguars, whales, and bears are examples of apex predators. Coyotes are apex predators where larger predators are absent.

**Carnivore** – An animal or plant whose diet consists mainly of animal tissue. Cougars and coyotes are carnivores, and the plant Venus flytrap is an example of a carnivorous plant.

**Ecosystem** – An ecosystem is a natural area; a dynamic complex of communities of plants, animals, and all other living organisms, along with their non-living environment, all interacting as a functional unit.<sup>1</sup>

**Food Chain, Food Web** – A food chain consists of a set of animals or organisms in which each organism feeds on the one below it (hence is eaten by the one above). A food web is a feeding and nutritional system made up of multiple interrelated food chains.

**Intraguild predation** – This is when a predator, one that competes with another predator for shared prey, kills or preys upon its competitor. Typically, the larger predator kills its smaller competitor.<sup>2</sup> Generally, in mammalian carnivore communities, intraguild predation occurs in one direction; for instance, wolves kill coyotes, but coyotes don't kill wolves.<sup>3</sup>

**Keystone species** – A keystone species is a species that has particularly strong and consequential interactions and impacts in an ecosystem, the strength of which is disproportionate to their numbers or densities.<sup>4</sup> Most large predators are keystone species, but many smaller, less charismatic species are keystone species as well, such as long-nosed bats, sea otters, prairie dogs, and mountain beavers,<sup>5</sup> because their presence or absence has such profound effects on a biological community.

**Mesopredator** – A mid-sized, mid-ranking predator in a food chain. Typical mesopredators include coyotes, cats, and foxes.<sup>6</sup> A mesopredator in one ecosystem may be a top predator in another (where the former top predator has been eliminated), and one ecosystem can have several mesopredators.<sup>7</sup> Coyotes are top predators in some systems and mesopredators in others where a higher-ranking predator is present (e.g. wolves).

**Mesopredator release** – A term coined by Soule, et al. (1988) to describe the process in which intermediate size mammalian carnivores become more abundant in the absence of a larger carnivore.<sup>8</sup> Prugh, et al. (2009) define mesopredator release as the expansion in density or distribution, or change in behavior, of a middle-ranking predator resulting from the decline in density or distribution of a top predator. Mesopredator release is often symptomatic of a fundamental ecosystem imbalance.

**Omnivore** – An animal that feeds on plants and animals.

**Predator, Prey, Predation** – A predator is an animal or organism that survives by eating other animals or organisms, the prey. Mountain lions are predators that kill and eat deer. Whales are predators that prey on plankton. Spiders are predators whose prey can be many other insects, such as dragonflies, moths, or other spiders. Predation is the act of a predator killing its prey.

**Top predator** – An apex predator; a predator at the top of its food chain. Wolves, jaguars, whales, and bears are examples of top predators. Coyotes are at the top of their food chain where larger predators are absent.

**Trophic cascade** – Robert Paine (1980) first used this term to describe the progression of direct and indirect effects of native predators across lower trophic (nutritional) levels in a food chain.<sup>9</sup> Thus, a trophic cascade occurs when the presence of top predators affects herbivores (plant-eating animals at the next lower trophic level), and this interaction affects vegetation (yet the next lower level).<sup>10</sup> For instance, wolves prey on deer and elk, which in turn limits the impact deer and elk have on plant biomass, which then preserves or creates habitat for other species. Another frequently cited example of trophic cascades involves sea otters (predator, and secondary consumer), sea urchin (prey, herbivore, and primary consumer), and kelp forests (plant, herbivory, and producer). Loss of sea otters in the North Pacific due to killer whales switching their prey from fish to sea otters (human over-fishing has reduced the fish supply) allowed the rapid growth of sea urchins, which overgraze kelp and cause the decline of other kelp-dependent species as well as the erosion of underwater landscapes (which in turn causes on-shore erosion).

## Sources

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<sup>1</sup> The Economics of Ecosystems and Biodiversity (2009).

<sup>2</sup> Roemer, G. W., M. E. Gompper, B. Van Valkenburgh. 2009. The Ecological Role of the Mammalian Mesocarnivore. *BioScience* 59: 165-173.

<sup>3</sup> Id.

<sup>4</sup> Soule, M. E., J. A. Estes, J. Berger, C. Martinez del Rios. 2003. Ecological Effectiveness: Conservation Goals for Interactive Species. *Conservation Biology* vol. 17, No. 5, October 2003, pp. 1238-1250.

<sup>5</sup> Id.

<sup>6</sup> Prugh, L. R., C. J. Stoner, C. W. Epps, W. T. Bean, W. J. Ripple, A. S. Laliberte, J. S. Brashares. 2009. The Rise of the Mesopredator. *BioScience* 59: 779-791.

<sup>7</sup> Roemer, et al., supra.

<sup>8</sup> Prugh, et al., supra.

<sup>9</sup> Beschta, R. L. and W. J. Ripple. 2009. Large predators and trophic cascades in terrestrial ecosystems of the western United States. *Biological Conservation* 142 (2009) 2401-2414.

<sup>10</sup> Ripple, W. J. and R. L. Beschta. 2005. Linking Wolves and Plants: Aldo Leopold on Trophic Cascades. *BioScience* vol. 55 No. 7: 613-620.