

Ecological niche



Ecological niche From Wikipedia, the free encyclopedia Jump to: navigation, search Black smokers create ecological niches with their unusual environment In ecology, a niche (CanE, UK /? ni?? / or US /? n? t? /)[1] is a term describing the way of life of a species. Each species is thought to have a separate, unique niche. The ecological niche describes how an organism or population responds to the distribution of resources and competitors (e. g. , by growing when resources are abundant, and when predators, parasites and pathogens are scarce) and how it in turn alters those same factors (e. . , limiting access to resources by other organisms, acting as a food source for predators and a consumer of prey). [2] The majority of species exist in a standard ecological niche. A premier example of a non-standard niche filling species is the flightless, ground-dwelling kiwi bird of New Zealand, which exists on worms, and other ground creatures, and lives its life in a mammal niche. Island biogeography can help explain island species and associated unfilled niches.

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Grinnellian niche The word " niche" is derived from the Middle French word *nicher*, meaning to nest. The term was coined by the naturalist Joseph Grinnell in 1917, in his paper " The niche relationships of the California Thrasher. "[3] The Grinnellian niche concept embodies the idea that the niche of a species is determined by the habitat in which it lives. In other words, the niche is the sum of the habitat requirements that allow a species to persist and produce offspring.

For example, the behavior of the California Thrasher is consistent with the chaparral habitat it lives in—it breeds and feeds in the underbrush and escapes from its predators by shuffling from underbrush to underbrush. This perspective of niche allows for the existence of ecological equivalents and also empty niches. For example, the Anolis lizards of the Greater Antilles are a rare example of convergent evolution, adaptive radiation, and the existence of ecological equivalents: the Anolis lizards evolved in similar microhabitats independently of each other and resulted in the same ecomorphs across all four islands. [edit] Eltonian niche In 1927 Charles Sutherland Elton, a British ecologist, gave the first working definition of the niche concept. He is credited with saying: "[W]hen an ecologist says 'there goes a badger,' he should include in his thoughts some definite idea of the animal's place in the community to which it belongs, just as if he had said, 'there goes the vicar. '"[4] The Eltonian niche encompasses the idea that the niche is the role a species plays in a community, rather than a habitat. edit] Hutchinsonian niche Squirrels in public parks may have a different ecological niche than those with less human contact. The Hutchinsonian niche views niche as an n-dimensional hypervolume, where the dimensions are environmental conditions and the resources that define the requirements of an individual or a species to practise " its" way of life. The niche concept was popularized by the zoologist G. Evelyn Hutchinson in 1957. [5] Hutchinson wanted to know why there are so many different types of organisms in any one habitat.

An organism free of interference from other species could use the full range of conditions (biotic and abiotic) and resources in which it could survive and

reproduce which is called its fundamental niche. However, as a result of pressure from, and interactions with, other organisms (i. e. inter-specific competition) species are usually forced to occupy a niche that is narrower than this, and to which they are mostly highly adapted. This is termed the realized niche. The ecological niche has also been termed by G. Evelyn Hutchinson a "hypervolume." This term defines the multi-dimensional space of resources (e. . , light, nutrients, structure, etc.) available to (and specifically used by) organisms. The term adaptive zone was coined by the paleontologist, George Gaylord Simpson, and refers to a set of ecological niches that may be occupied by a group of species that exploit the same resources in a similar manner. (Simpson, 1944; After Root, 1967.) [citation needed] Hutchinson's "niche" (a description of the ecological space occupied by a species) is subtly different from the "niche" as defined by Grinnell (an ecological role, that may or may not be actually filled by a species—see vacant niches).

Different species cannot occupy the same niche [citation needed]. A niche is a very specific segment of ecospace occupied by a single species. Species can however share a 'mode of life' or 'autecological strategy' which are broader definitions of ecospace. [6] For example, Australian grasslands species, though different from those of the Great Plains grasslands, exhibit similar modes of life. [7] Once a niche is left vacant, other organisms can fill that position.

For example, the niche that was left vacant by the extinction of the tarpan has been filled by other animals (in particular a small horse breed, the konik). Also, when plants and animals are introduced into a new

environment, they have the potential to occupy or invade the niche or niches of native organisms, often outcompeting the indigenous species. Introduction of non-indigenous species to non-native habitats by humans often results in biological pollution by the exotic or invasive species.

The mathematical representation of a species' fundamental niche in ecological space, and its subsequent projection back into geographic space, is the domain of niche modelling. [8] What is the ecological niche of a Slater?

In: Insects [Edit categories] Answer: the slater's lives in dark places. uptake water by eating food Rate This Answer Upper Hutt College Year 13 Biology Slater Study Achievement standard: biology 3. 1 Introduction to experiment: In this investigation of the ecological niche of the woodlouse, I chose to experiment the amount of soil moisture that the slaters tend to prefer.

I chose this aspect, as moisture is a vital part in the survival of this small creature. Internet sources provided information of the woodlice that shows that they are from crustacean descent and formerly aquatic even though now they are terrestrial rather than water dwelling. Slaters are generally found in moist, dark places with decomposing plant matter. Enter Slater Diagram From two diagrams it is shown the area of the slaters lungs are near the rear end of the woodlouse and located inside the pleopod, these are where the gills are hiding.

The Slater is a creature that receives its oxygen through moisture in its surroundings, which is why I chose to do an experiment on moisture and in which amount of water is most suited to their survival and not a threat. The Woodlouse also has no waxy layer on its body which means desiccation is easy compared to other bugs, this is another reason why the slater need

moisture in its environment. Aim: The aim of this investigation is to experiment using woodlice and test on which amount of soil moisture they prefer. Hypothesis:

I believe that the more soil moisture there is, the more slaters will be found in that area. Independent Variable: The independent variable of this experiment will be the amount of water that is to be added to the soil. This variable will be measured using millilitres and a measuring cup. The range of values for this will be: 0mls, 25mls, 50mls, 75mls and 100mls. To keep this experiment as fair and accurate as possible, the water will be the exact amount by myself getting down to eye level and pouring the water in little amounts to get the precise amount of water needed. Dependent Variable: