

# Indicator Species – Part 1

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**L**AST week my article was about a group of interesting and important organisms – Scavengers, without which our environment would be littered with the bodies of dead plants and animals.

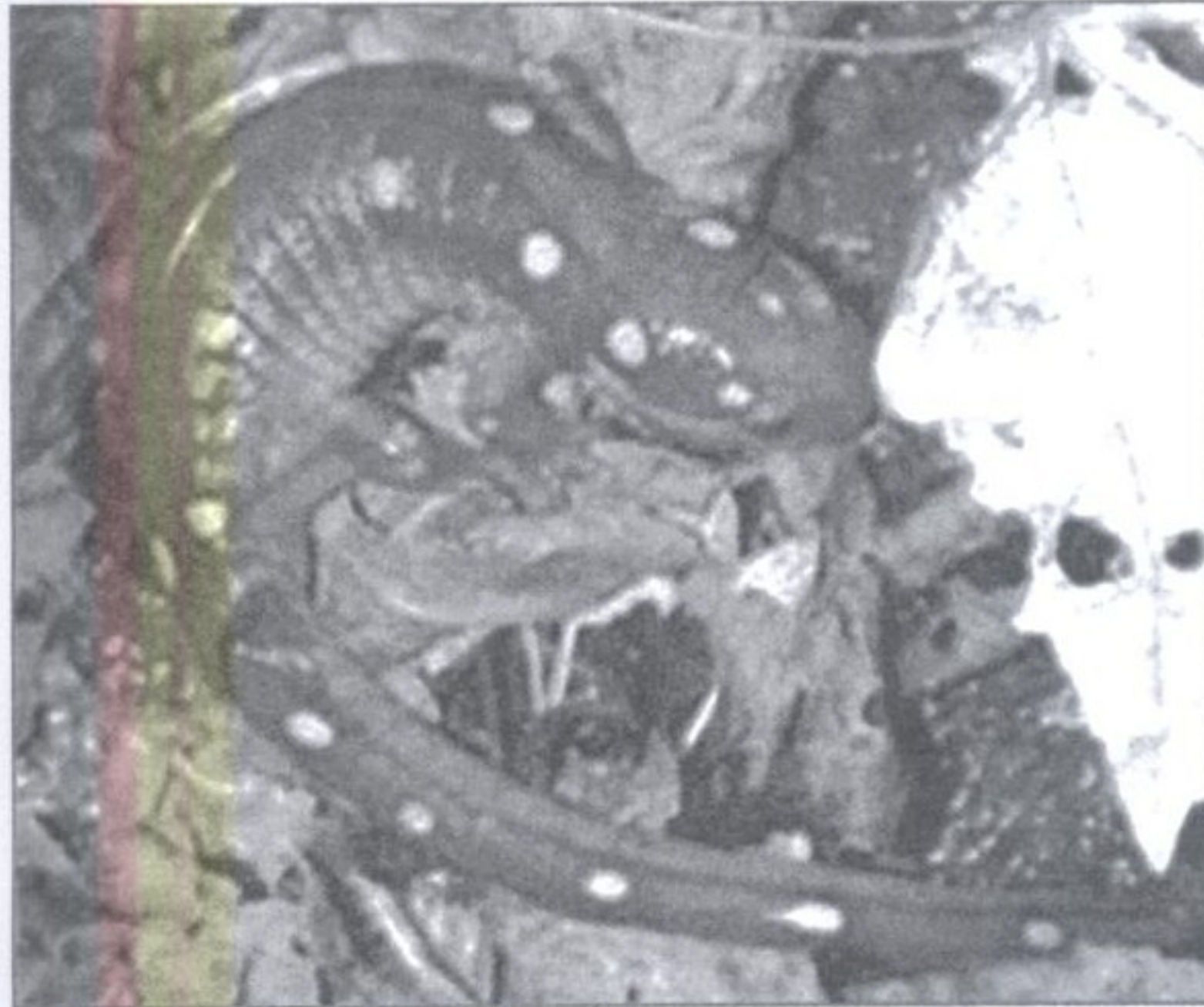
These bodies act as breeding places for disease spreading organisms and in them are locked away a store of nutrients. Another group of important organisms referred to as Indicator species; their presence is taken as a sign that the ecosystem is either healthy or unhealthy. Organisms from both terrestrial and aquatic ecosystems can be used as indicators. However, I will look at those from aquatic ecosystems in the second part of this article, due to the quantity of information on the topic. In this part, I will focus on Terrestrial Indicator Species and elaborate more on the signs these species give to indicate the health of our environment. These signs are best shown using a variety of examples.

Terrestrial indicator species are referred to as Biological indicators or Bioindicators.

These species include both plants and animals whose presence can be used to provide information on the environment or area.

For instance, if the presence of a certain species is limited to either a certain area or ecosystem, then its absence or shrinking population can be taken as an indication that their habitat is also shrinking or that the conditions there are changing.

Indicator species can be thought of as the most sensitive in the region so that their presence or distribution can



be used as an Early Warning System by scientists.

However, these organisms do not always have to die to indicate that something is wrong in the environment; some might show signs of disease, while other more mobile organisms may leave the area, which can be interpreted as a reaction to changing climatic conditions.

Sometimes a change in conditions may change the appearance of the indicator species, for example a change in the mineral composition of the soil

might cause the leaves of a plant species to turn from green to yellow.

In terms of terrestrial organisms, there has recently been work investigating the use of invertebrates as bioindicators, in particular insects such as ants and grasshoppers. Other invertebrates such as spiders are also being explored for their potential use as bioindicators. The use of spiders for this purpose stems from the fact that spiders are predacious. Therefore they are highly sensitive to the availability of food lower down the food web. So if spiders

are absent from an area it could mean that the prey available is present in too low in numbers to support them or absent altogether.

Tiny organisms like lichens, which are actually a combination of fungi and algae are sensitive to sulphur dioxide gas which is emitted in industrial and exhaust fumes. Therefore they are not found alongside roadsides or around large towns and cities. Therefore their presence indicates an area is pristine. However, some forms of lichens are more tolerable than others to low levels of sulphur dioxide gas.

Amphibians are another good group of indicator animals; their skin is both permeable to air and water as they spend part of their life on terrestrial and aquatic environments. Therefore they are sensitive to both air and water pollution. For instance, the nitrogen and phosphorous contained in the water that runs off from fertilised agricultural land causes an increase in algal production which is the ideal habitat for a certain parasitic flatworm species. These in turn attack frogs in their tadpole stage causing growth deformities such as missing or extra limbs. This of course affects their ability to swim, find food and mates, thus lessening the population's chance of survival in that area.

Therefore we see that species both plants and animals can be used as indicator species based on their sensitivity to the conditions in their habitat. Unfortunately it is this sensitivity which and in some cases their extinction which serves to indicate that something is wrong, which by that time it is too late for them. We therefore, need to pay attention to these changes and take the appropriate actions for preservation of our biodiversity and to correct imbalances in the surrounding atmosphere connected with pollution.