

Amphibians as Ecological Indicators

As our environment rapidly changes from various threats, we are left to wonder exactly what the implications and effects of these impacts are. A clue to examine these impacts, or even monitor restoration efforts, can be considered with the use of an ecological indicator. An ecological indicator can be defined by the EPA as, “A measure, an index of measures, or a model that characterizes an ecosystem or one of its critical components.” With this perspective, ecological indicators can be used to assess environmental conditions and trends over time.

Amphibians have often been thought to serve as a particularly desirable indicator species. They utilize both aquatic and terrestrial habitats, as dictated through their biphasic life cycle, and their skin is permeable. For these reasons, they are considered to be more sensitive (in both habitats) to environmental changes and stressors than other species (Blaustein et al. 1994). In addition, many species can usually be found in abundance and monitoring efforts are considered effective. Most amphibians are very predictable as far as their reproductive queues. Observing changes in the behavior of amphibians can indicate potential environmental contaminants or pollution sites (Hammer et al. 2004). Abundance and populations of species can illustrate the overall health of the ecosystem and habitat quality. For example, if a significant increase in population is noted, one indication may be for very favorable conditions in the environment with this species; often more precedent than even vegetative responses.

A program hoping to utilize an example such as the previous scenario is the Comprehensive Everglades Restoration Project (CERP). This project aims to restore, protect, and preserve water resources in over 16 counties of southern Florida. In terms of CERP, “The community of amphibians in the Everglades was chosen as an important group for this assessment process because of the sensitivity of amphibians to changes in the environment. Amphibians should be excellent indicators of the success of Everglades restoration, but a clear understanding of how amphibians will respond to changes in the environment is required. The goal is to develop the tools needed to predict and monitor changes to amphibian communities due to restoration (USGS 2004).”



The Environmental Resource Management Department (ERMD) with the Seminole Tribe of Florida is currently establishing baseline reptile and amphibian studies to achieve goals in implementing these tools as well. The surveys take place on the Brighton and Big Cypress Reservations and record an inventory of all the native and non-native species of reptiles and amphibians. This is achieved through a series of visual and

audible surveys which are conducted at night, as most species are more active then. Audible methods rely on distinct, species specific calls; while visual methods involve the use of spotlights, traps, and artificial refuges. With a compilation of data, future insights and conservation plans can be established to protect native species and the ecosystems for which they serve as indicators. Some amphibian species observed on the reservations include, but are not limited to: green tree frog, cricket frog, southern toad, barking tree frog, squirrel tree frog, pig frog, and the oak toad.

If you have any questions, the Environmental Resource Management Department will be happy to answer them.



Adult pig frog (Brighton)