Monitoring Pond Breeding Amphibians

Background

Cape Cod National Seashore contains an abundance and diversity of freshwater wetlands which support significant populations of amphibians, some of which are regionally uncommon. Considered important indicators of environmental quality, amphibians play a significant role in the energy flow (predator-prey relations), biomass, and community structure of these wetlands. Amphibians are also important for the flow of energy between wetland and upland habitats. Although awareness of the ecological significance of amphibians is increasing, they face a great variety of human threats. Loss of upland habitat to development, wetland draining and filling, pesticides, acid deposition, road mortality, diseases, and introduced competitors and predators have all been implicated in amphibian declines.

Methods, Status, and Trends

Monitoring of pond-breeding amphibians was initiated in 2002 and consists of two components, egg mass counts and anuran calling surveys. NPS staff monitor abundance and distribution of spotted salamanders (*Ambystoma maculatum*) and wood frogs (*Rana sylvatica*) by counting egg masses in vernal ponds each spring. Anuran calling surveys are used to monitor relative abundance, distribution, and habitat associations of breeding frogs and toads each spring and summer at a wide range of wetland types.

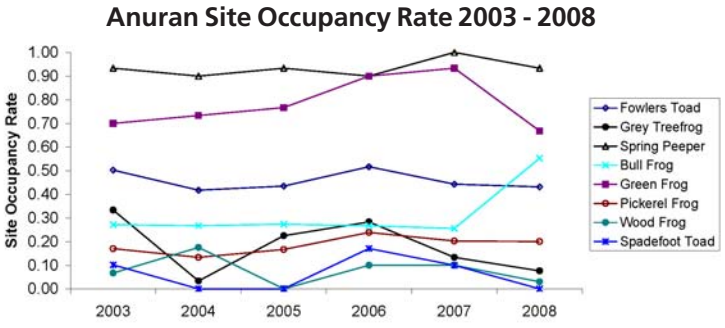

Figure 1. Annual variation in site occupancy rate for CACO anurans.

Figure 2. Listed as a "Threatened" species in Massachusetts, Cape Cod National Seashore is one of the few places in the Northeast where the eastern spadefoot toad is fairly common. Spadefoot toads breed in spring following very heavy rainfall, and many are killed on local roads. The park closes Province Lands road in an attempt to reduce this impact.

Data collected so far have provided an important baseline of species distribution, abundance, and habitat associations, but because the data only span several years and show substantial annual variation, meaningful long term trend analysis is not possible at this time.

Applications

This program has helped identify regionally significant populations in the park, as well as those areas that are important for supporting them. This has lead to specific management actions, such as road closures on rainy nights to minimize roadkill. Information on park amphibians has also been incorporated into many aspects of park planning and environmental impact analysis and mitigation. Over the longer term, the data will be used to determine if there are changes in the abundance, distribution, or structure of amphibian populations and communities, and if so, what the likely causes are.

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