Celebrity Wright

EFB 390

**Introduction**

The New York Department of Conservation’s purpose is to manage wildlife populations throughout New York State. However, management is not carried out equally for all organisms. Herpetofauna, or amphibians and reptiles, are not efficiently managed by the New York Department of Conservation due to lack of awareness, funding, and education. Current species populations are unknown due to the fact that there has not been a survey since the Amphibian & Reptile Atlas Project (Herp Atlas) conducted in the 1990s (DEC₁ (n.d.)). The New York Amphibian & Reptile Survey (NYARS) currently aims to analyze populations so that there can be updated information to manage herpetofauna (Amphibian & Reptile Survey (n.d.)). Amphibians and reptiles do not receive the funding required for thorough research like other organisms. This is due to wildlife researchers and the general public showing more enthusiasm for other organisms. In addition, amphibians and reptiles are not major contributors to the economy (Olson and Pilliod 2022). Hunting regulations exist for frogs and turtles. However, they are loose for when and how many can be hunted (DEC₂ (n.d.)). Poor hunting regulations contributes to the lack of knowledge about amphibian and reptile populations as people may possibly be hunting them to the point of extirpation. Another reason for population decline is habitat fragmentation. When herpetofauna mate, they migrate to their designated mating and nesting areas. Unfortunately, habitat fragmentation means they usually have to cross roads to reach their destination, which results in roadkill (DEC3 (n.d.)). Roadkill is one of the main contributors to amphibian and reptile death and chytrid fungus (Batrachochytrium dendrobatidis). Chytrid fungus prevents respiration by infecting keratin cells (DEC4 (n.d.)). To conserve herpetofauna populations, there must be an increase in awareness, funding, and education.

**Increasing Awareness among Scientists**

The first step in amphibian and reptile conservation through proper management is awareness. Wildlife managers must be aware of the potential dangers herpetofauna face. The way to accomplish this is through research. From 1990 to 1999, the Amphibian & Reptile Atlas Project determined the location and number of amphibians and reptiles. However, no surveys on their populations have been completed since then (DEC₁ (n.d.)). Fortunately, the New York Amphibian & Reptile Survey (NYARS) is being done to make up for this missing data. Most of the study is carried out at Hobart and William Smith Colleges and the State University of New York College of Environmental Science and Forestry. Through the new survey people can document and upload information on herpetofauna they find in the wild. There is also general information provided as well as graphics (Amphibian & Reptile Survey (n.d.)). Gibbs (2022) explained that eBird and iNaturalist are the current ways herpetofauna are located. Another current research opportunity to conserve these organisms is the Amphibian Migrations and Road Crossings (AM&RC) Project under the New York Department of Conservation. The project ensures that amphibians can mate and hibernate during mating seasons by analyzing traffic, migration hotspots, and weather. An added benefit is volunteers are able to track amphibian numbers (DEC3 (n.d.)). Another area of research conducted by the New York Department of Conservation is in their Upper and Lower Lakes Wildlife Management Area. Management began in 2016 and has implementation plans leading up to 2025. Two habitat types with management plans for amphibians and reptiles within the land are open water and wetlands. One of the species monitored there is Blanding’s turtle. Researchers inhibit equipment use and water fluctuation for their conservation in the wetlands. For open water, vegetation is managed through drawdowns for ecosystem balance for herpetofauna (Latremore and Town 2016). Roadkill is a major contributor to amphibian and reptile death. Therefore, solutions to prevent such deaths need to be implemented to protect organisms within the species. Langen (2007) found using cars to obtain road-mortality data inaccurately portrayed deaths, especially for frogs, despite cars being able to gather more data. Using this study wildlife managers can find ways to collect data on road-mortality for reptiles and amphibians without compromising one aspect for another. Furthermore, Langen explained species-specific and overall herpetofauna habits help obtain sufficient data. Langen (2010) found that steel fences covered with vinyl protected turtles. Another area wildlife managers can study is how temperature affects chytrid fungus' rate of infection. Rollins-Smith (2020) discovered that the fungus tends to infect amphibians less in spring and summer and more in fall and winter. It is critical that wildlife managers analyze this phenomenon in order to determine ways for amphibian conservation.

**Increasing Funds for Herpetofauna**

Awareness cannot occur with funding. A study on amphibians and reptiles found that field study and funding for it was lacking under a grant-publication index. An example of the severity of the situation can be observed through tuataras. The study explained they received no field study grants nor a decent grant-publication index despite being the highest endangered herpetofauna (de Oliveira Ferronato 2019). Chytrid fungus is another reason why amphibians and reptiles need to receive more funding. The skin of amphibians has keratin cells that becomes infected with it and then builds until suffocation occurs (DEC4 (n.d.)). If wildlife managers do not currently have population estimates for amphibians and reptiles, we do not know if chytrid fungus is driving them to extinction. The New York and Amphibian Reptile Survey (NYARS) is currently receiving some of their funding from The Wetland Trust, Roosevelt Wild Life Station, and New York State Water Resources Institute (Amphibian & Reptile Survey (n.d.)). Therefore, funding exists for herpetofauna. People need to be better educated about them in order for funds to go toward research.

**Educating Hunters and Other Citizens**

Education has a valuable role in conserving amphibians and reptiles. Wildlife managers are not the only people who must acquire knowledge of herpetofauna, but other citizens too. Hunters are one group who can gain knowledge about amphibians and reptiles as current hunting regulations are poor. Lizards, snakes, salamanders, and turtles, except for snapping turtles, are being efficiently managed since they are not allowed to be hunted in New York State. However, the opposite is true for frogs and snapping turtles. Snapping turtles have few regulations as they can be hunted across the state from July 15 to September 30. Thirty bags per season can be hunted and five bags maximum filled per day, all day. The rule for size of turtles hunted is a 12-inch carapace with a bow or gun under a hunting license. Frogs have little to no protection in hunting except eastern spadefoot and northern cricket frogs since they cannot be hunted. Frogs can be hunted from June 15 to September 30 by club, hand, spear, hook, bow, or gun under a hunting and fishing licenses. No guns can be used at night, but frogs can hunted all day and night. There are designated areas for hunting leopard frogs. Unfortunately, there is no restrictions on size nor bag amount for frogs. Gibbs (2022) discussed how politicians are being asked when and how overhunting can be prevented. Hunters can be taught about chytrid fungus (DEC₂ (n.d.)). This may make them take into consideration the amount of amphibians they harvest and actions they can take to prevent the fungus from spreading. Another fact hunters should know before harvesting is turtles have low fecundity with late sexual maturation. Therefore, snapping turtles should be harvested responsibly, especially since land turtle populations are decreasing in New York State (DEC4 (n.d.)). In addition, one of the most smuggled reptiles are tortoises (Stringham et al. 2021). All citizens should be aware of the dangers habitat fragmentation has on herpetofauna. Driveways and roads lead to amphibian death when they are migrating (DEC3 (n.d.)). It is presumed that thousands to tens of thousands of amphibians and reptiles die from cars (Gibbs 2022). Therefore, citizens should pay attention for them as well as pedestrians. Gomes da Silva (2021) found that many people feared snakes due to biology and culture. However, there is hope as people do not view reptiles and amphibians to be as scary anymore. To prevent being possible bitten, citizens should be cautious, but respectful, of them too. Education extends to construction companies. They can be shown critical amphibian habitats to avoid these areas as much as possible as explained by Lee et al. (2022).

**Conclusion**

In conclusion, awareness, funding, and education must increase for amphibians and reptiles. By improving these areas, herpetofauna populations can effectively be managed and conserved. Our interview with Gibbs (2022) solidified the fact that not much has been done to monitor fluctuations within amphibian and reptile populations. One reason for this is wildlife managers do not conduct enough research for the group of organisms. Another reason for poor herpetofauna management is insufficient funding toward research. Finally, current education in New York State should teach hunters about amphibian and reptile populations and citizens about roadkill to help in management.

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