Poultry, Fisheries & Wildlife Sciences

Applegate, Poult Fish Wildl Sci 2014, 2:1
DOI: 10.4172/2375-446X.1000e107

Editorial Open Access

Sciences as a Basis for Wildlife Conservation

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Sciences, including wildlife science, are dichotomous. On the one hand there is wildlife science itself which is an applied field that makes use of many other scientific disciplines. One the other hand are the basic or fundamental sciences which provide the basis of all applied theory. Scientists whose responsibilities involve management of wildlife resources rely on applied research to devise management strategies. However, often in education and research, we leave the basic foundational disciplines behind.

For wildlife science much of the basis is biology and specifically cell and molecular biology, physiology, and all of the biological disciplines at all scales. Many wildlife species of economic or conservation concern lack data on physiology, behavior, and other fundamental aspects of biology. When developing conservation or management strategies, the lack of this knowledge weakens our ability to properly manage these species.

The northern bobwhite (*Colinus virginianus*) is a popular game bird in North America. Its range spans the entire region from the U. S. Midwest and northeast through the southwest to Guatamala. In much of the U. S. range the species is declining due to a wide variety of factors that hinge primarily on quantity and quality of habitat. Many U. S. states and interested organizations have formed a consortium that is focused on recovery of this species. This consortium, known as the Northern Bobwhite Conservation Initiative (NBCI) has developed an extensive plan for recovery. Yet, with all of this effort lack of knowledge of some fundamental aspects of northern bobwhite biology hinders our ability to restore.

Most of the data we have on physiology including nutrition of northern bobwhites is from domesticated strains of this bird rather than from wild birds. Domesticated forms of northern bobwhite have been around since sometime in the late 1800's. These birds are bred totally in captivity and are tractable in the sense that they are tame enough to survive and breed in the pen. Wild birds, on the other hand, have been bred and reared entirely in natural conditions where they are subjected to all of the elements that drive selection for adaptive traits. The domestic strains, on the other hand, are selected for human value traits in the same way that other species of poultry are selected.

Many domestic northern bobwhites are released for shooting or for the mis-guided sense of helping to restore the wild population. Even where traits for wildness in behavior, flight capability, and other aspects are desired in these domestic strains, the single key trait of tameness overrides.

This means that physiological and nutritional data from domestic northern bobwhite do not necessarily reflect the physiology of birds in the natural environment. Our lack of this data hinders our ability to restore this species in the wild and clouds the way we view the impact of domestic northern bobwhite releases on remaining wild populations.

In order to be fully successful in restoration of this declining species, and many others, we need to literally get back to basics. To do so means that we need to eliminate the basic vs. applied research dichotomy and recognize that fundamental facts about an organism are just as critical as applied facts. In fact, I would argue that there cannot truly be applied facts unless we have learned the basic facts.

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Received February 10, 2014; **Accepted** February 11, 2014; **Published** February 14, 2014

Citation: Applegate RD (2014) Sciences as a Basis for Wildlife Conservation. Poult Fish Wildl Sci 2: e107. doi:10.4172/2375-446X.1000e107