

Learning from our past loss and mistakes to allow for future conservation

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Once species are extinct, they are gone forever. The negative consequences of their extinction on their habitat and on other species whose survival is linked with them is everlasting. Often times, we passively say a species has gone extinct, but we do not consider the future implications of an event such as extinction. In the book *The Condor's Shadow: The Loss and Recovery of Wildlife in America*, David Wilcove, who has served as a Senior Ecologist at Environmental Defense in Washington, DC, delves into species survival and extinction. He is the author of scientific publications and articles on conservation biology and endangered species. In this book, Wilcove describes how species survival is dependent on other species, and he also provides readers with examples of how habitat destruction leads to species extinction and precious land loss. Lastly, throughout his book he incorporates examples of how technological advancements, non-native species introduction, overexploitation such as in the fisheries, and oblivious laws have led to the demise of various species of North America. This book seems to be directed at an ecologically literate audience – there are explanations of major key terms such as keystone species and succession, which if the audience already possesses knowledge of, will allow for the devastating effects explained in the book to truly be understood and Wilcove's work can be given justice. Since he has previously focused on developing economic policies to protect endangered species. While insects are diverse and abundant in almost every environment, Wilcove acknowledges that the focus of this book is on bigger mammals, birds, and amphibians which are better studied and known. Along with depicting all these examples, Wilcove gives examples of how humans have attempted to fix problems, which often times they themselves have caused, with solutions that turned out to be even more detrimental. Wilcove implicitly suggests through the examples he has incorporated that humans should be more aware and educated about their environment to prevent further species extinction and environmental degradation.

The text reflects how habitat destruction caused by deforestation and forest fragmentation leads to the alteration of habitats, the loss of species, and ultimately to an overall reduction of biodiversity. When eastern forests were cut down over a span of two centuries, the ivory woodpecker went extinct because this species required old-growth forests to survive. Similarly, the Bachman's Warbler also went extinct as a direct result of the eastern forest deforestation. Furthermore, forest fragmentation harmed songbirds by reducing their ability to produce offspring and also by exposing them to higher rates of predation since the woodlots were smaller. In addition, there was a higher proportion of edge in the forests, which resulted in higher densities of predators that primarily resided in the edges. All these extinct species had one thing in common, their habitat was destructed through either deforestation or forest fragmentation caused by humans.

Another element of habitat destruction the book delves into is agriculture, which started as early as the eighteenth and nineteenth centuries. While agriculture allowed for human

settlement, due to habitat alteration it often led to the demise of many species. The conversion of forests to farmlands proved to be disastrous for species such as the grasshopper pileated woodpecker, broad winged hawk, and worm-eating warbler. Agricultural revolutions not only destroyed North America's grassland fauna, but they also greatly reduced the populations of songbirds by a fraction compared to the previous decade. Wilcove delves into deforestation, forest fragmentation, and agricultural revolutions and focuses on how many of these habitat destruction pathways are managed by humans. These examples depict how humans have been the ecosystem engineers, and they have not used their power for the better in many cases.

With technological advances, that were again beneficial for humans, the effects on the animals seemed to get progressively worse. When the first transcontinental railroad was finished in 1869, it led to the pathway for the extinction of bison. Advancements such as the expansion of the railroads and the invention of the telegraph allowed commercial hunters to progress and communicate. Unfortunately, as the bison made its way to extinction, hunters did not consider how bison influenced their habitat and other species whose survival was linked to the bison. The railroad expansion also aided the Western Coast population to grow and allowed the timber companies to target the western forests. Humans also constructed dams in the Colorado River, which contained four dominant species of fish: squawfish, back sucker, humpback chub, and razorback sucker. However, when humans placed dams in the river, they reduced the spring and summer floods and lowered water temperatures, which lead to disruptions in the fish reproductive cycles. Again the dams were constructed for human progress and they caused lots of harm to species. The book depicts these negative consequences and emphasizes how humans can be attributed to the cause of these problems. Wilcove's incorporation of these examples contributes to the overall aim of the book of relaying the importance of learning from our previous mistakes to preserve what we have left.

The book delves into how due to people's ignorance, new species, pests, and diseases were unfortunately introduced and this contributed to the decline of native species of North America. In 1904, due to the accidental introduction of the fungus responsible for Chestnut Blight in Japan into North America, the American chestnut underwent an ecological extinction as all of the species' trees suddenly turned leafless. While this particular introduction was not on purpose, the consequences of non-native species introduction was obviously detrimental. Despite knowing this, we continue to ignore the effects of non-native species introduction. We purposefully introduced lake trout and kokanee salmon (non-native species), into the Colorado River thus causing the native and dominant species present there, such as the squawfish and chubs, to struggle to survive in their own habitat. These examples further demonstrate that we failed to acknowledge our past to make decisions for the future.

The book also consistently demonstrates how humans continued to overexploit species in the fisheries and during their hunting endeavors and this further escalated the decline of species. When the blue pike fish numbers declined in 1958 due to excessive fishing, the fisheries managers were not concerned about the decline. However, in 1967, the U.S Fish and Wildlife Service declared the fish extinct and the last blue pike fish was sighted in 1974. By this time, the effects were not reversible. Among the many other exploitation examples, another example involved the Hudson Bay company in November 1743. The company was involved in creating

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pelts and they disposed thousands of beavers, martens, and wolves of their skin. Although these animals did not go extinct, their numbers were reduced greatly. Despite all these examples at our disposal, close to the 19th century the apparel industry had high demands of feathers from birds for women's hats, and again this led to the brutal killings of herons, terns, sandpipers, and gulls to obtain the feathers. Interestingly, humans did not learn that their selfish desires put species at risk of endangerment and extinction, and Wilcove incorporated these examples one after another to critique how ignorant we are towards our surroundings. These examples help develop Wilcove's argument that a lot of damage has already been done.

After causing problems, we attempt to fix the problems that we are not adequately educated about by passing laws that are detrimental to species and their habitats. Often times we also ignore the laws that are actually beneficial. An example of laws that were passed with not adequate knowledge includes the flood control program authorized Congress after the 1947 and 1948 South Florida hurricanes. This led to water pumps and storage areas and as a result the Everglades were drained causing the wood stork population to decline from 20,000 pairs to about 5,000 pairs in the 1980s. On the other hand, an example of a law that was beneficial and not followed was related to sea turtles. When sea turtles were drowning due to shrimp nets, the National Marine Fisheries Service did not want to prohibit trawling. They decided to find a technological solution in 1980, the Turtle Excluder Device (TED), which allowed turtles to remain unharmed, but shrimpers did not want to use them because they thought their shrimp yield would be affected. The Fisheries Service declined to make the TED mandatory therefore its use was stopped. While this could have been a key step to prevent harming sea turtles, the law was not enforced.

This book discussed how species have been impacted in the realms of the land, water, and sky. The book is a great read and it also fulfills its aims to make the readers more literate about habitat and species lost and suggests implicitly that we should make efforts towards conservation before it is too late. While the majority of the book focuses on what we have done wrong and how we have lost a lot of species and land, it would be interesting to see an optimistic point of view in the book. Wilcove should have presented us with solutions to some of the problems such as deforestation. While the devastating effects of extinction and habitat destruction cannot be reversed, it is essential to consider some solutions to such problems to avoid them in the future. The book is directed towards a more scientific audience, specifically an audience who is aware of concepts of biology and ecology. While college students that are not science majors and the general nonscientific audience such as parents and siblings can easily follow Wilcove's thorough arguments, a scientific audience will fully understand the devastating situations presented in the book because of their previous knowledge. Furthermore, the book is more relatable after taking a course of ecology and evolution because many concepts covered in the book are also covered in class. In the Biology 220 offered here at Lake Forest College, many concepts such as deforestation, forest fragmentation, species interactions, keystone species, and succession, along with many big picture ideas are introduced to students. When Wilcove presented these concepts in the book, they were familiar and his examples added to a well-rounded understanding of the topics. Furthermore, passionate students who understand the devastating situation Wilcove presents in the book can take this knowledge and make use of it by taking part in ecological internships or even

join conservation efforts. Since the past is essential to consider in order to learn from our mistakes, this book should be read because it serves as a terrific reminder on how precaution should be used in order to preserve what we have left.

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