# Developing an Adaptive genetic Management Framework for Wood Bison in Canada

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The single greatest limiting factor affecting recovery of wood bison (Bison bison athabascae) in Canada is the presence of bovine tuberculosis (Mycobacterium bovis) and brucellosis (Brucella abortus) in and around Wood Buffalo National Park (WBNP). Despite salvage of healthy wood bison from WBNP in the 1960s (Mackenzie and Elk Island National Park (EINP) wood bison herds), the majority of genetic diversity for this threatened subspecies still exists in the diseased bison herds of the greater WBNP ecoregion. The genetic diversity in the Mackenzie and Elk Island National Park wood bison populations is substantially less than the wild populations from which they were salvaged, largely due to a combination of founder effect and genetic drift. In addition, disease-free wood bison herds that have been established through national recovery efforts have been generally managed as small and genetically isolated populations. Conservation of genetic diversity is fundamental to the management of threatened and endangered species. As it is generally recognized that reduced genetic diversity and the accumulation of deleterious alleles due to founder effects and genetic drift in small populations may increase inbreeding depression and reduce evolutionary potential, there is an important need to evaluate the benefits and specific requirements for genetic management in wood bison. Through collaboration with provincial and territorial jurisdictions, our goal is to develop an adaptive management framework for conservation of genetic diversity of wood bison, which outlines management-oriented conservation strategies based on the theoretical concept of genetically viable wood bison populations. Within an adaptive management framework - where management actions may be used to test and evaluate specific predictions and objectives of genetic management - we will specifically address two issues: 1) strategies for genetic salvage, conservation, and management of genetic diversity of wood bison in Canada, and 2) maintenance of gene flow among disease-free wood bison herds within a metapopulation approach. We anticipate that we will accomplish the following key deliverables: 1) prioritize & formulate conservation strategies in a comprehensive and integrated genetic management action plan (as part of the National Wood Bison Recovery Plan), and 2) outline specific long-term objectives for the conservation genetics of wild and captive wood bison populations.