FORENSIC DNA TYPING IN GRIZZLY BEARS (URSUS ARCTOS) IN ALBERTA, CANADA

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The grizzly bear is the larger of two bear species found in the Province of Alberta. The management and protection of this large predator is of special interest to Alberta Fish and Wildlife. The objective of this project is to evaluate STR DNA typing for grizzly bear management and law enforcement applications. This project involved the analysis of DNA from over 150 grizzly bears from Alberta. The grizzly bear DNA was interrogated using 12 microsatellite markers and one sex typing marker. These panels of markers were used in three multiplexed PCR reactions. Analysis of the genotypes using Genepop indicate that the markers used are in Hardy-Weinberg equilibrium and that none of the loci are genetically linked. Analysis of the data by Microsatellite toolkit and Structure indicate that these markers are appropriate for forensic use and that some genetic structure exists between the northern, central and southern populations of grizzly bears in Alberta. These tests and databases have already been used in a forensic capacity. A casework example using this technology involves an investigation into the fatal mauling of a hunter by a grizzly bear. The armed victim was killed and eaten by a grizzly in late November 2007. The bear then immediately denned for hibernation. A bear hair recovered from the site of the occurrence provided the DNA for analysis. The genotype showed that the bear involved was a female grizzly. In the spring of 2008, Alberta Fish and Wildlife began a concerted effort to live trap grizzly bears in the area of the attack. Four grizzlies were trapped. The analysis of DNA from the trapped bears resulted in the identification of the bear responsible for the attack. This DNA technique has proven to be a valuable tool for use in protection and management of this species in Alberta.