

# A new class of differential equations with impulses at instants dependent on preceding pulses. Applications to management of renewable resources

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In this paper, a new type of mathematical model to represent certain processes with impulsive dynamic behavior is introduced. The main assumption is that the next impulse time is determined by three fundamental elements: the present impulse time, the state at this moment, and the value to which this state is impelled. We also establish the basic results of existence, uniqueness and continuation of solutions for these new impulsive differential equations. It is observed that the new equations have interesting applications in Bioeconomics, and sometimes they include, the traditional impulsive equations in variable times. © 2012 Elsevier Ltd. All rights reserved.