BAIT BUCKET TRANSFER POTENTIAL BETWEEN THE MISSISSIPPI AND HUDSON BAY WATERSHEDS

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ABSTRACT

Ludwig, Herbert Reinard, Jr., M.S., Natural Resources Management, Department of Agricultural Economics, College of Agriculture, North Dakota State University, December 1994. Bait Bucket Transfer Potential Between the Mississippi and Hudson Bay Watersheds. Major Professor: Dr. Jay A. Leitch.

The potential inter-watershed transfer of water from the Mississippi Watershed to the Hudson Bay Watershed has aroused concerns from environmental groups and Canadian authorities. One of the concerns is the potential for non-native aquatic biota to be introduced into the Hudson Bay Watershed, thereby affecting the biotic integrity of the receiving waters. This study was conducted to assess the probability for bait fish to be moved from the Mississippi River Watershed to the Hudson Bay Watershed by bait vendors or anglers transporting live bait. The investigation included all aspects of the live bait industry, from the capture of wild bait to its use by anglers. The procedure included surveying bait wholesalers, interviewing bait retailers, conducting a creel survey, and collecting minnows from retailers.

The transfer of bait across watershed boundaries, or bait bucket transfer, was separated into four distinct steps: (1) transportation of bait between watersheds, (2) angler's release of minnows into angling waters, (3) survival of released minnows, and (4) released bait's entrance into the watershed's ecology. Each step was assigned a probability. Two analytical techniques were used: the binomial probability formula and the normal approximation to the binomial. The probability of bait bucket transfer between the Mississippi River and Hudson Bay watersheds is small for one angler on one fishing day (0.00385). But, the probability approaches one when the 20 million angling days and approximately 33,000 live bait deliveries in North Dakota and Minnesota are considered. Given this result, policymakers should carefully consider extensive outlays to "prevent" biota transfer as a result of water project development.