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16 Eagle River Flats: A Potential Repellent for Reducing Waterfowl Ingestion of White Phosphorus. J.L. Cummings, L. Clark, P.A. Pochop and J.E. Davis, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Animal Damage Control, Denver Wildlife Research Center, Denver, Colorado. The U.S. Army has used the Eagle River Flats (ERF) on Fort Richardson (Alaska) as an artillery impact area since 1945. The 1000 hectare salt marsh is a spring and fall staging area for migrating waterfowl. In August 1981, hunters discovered a large number of duck carcasses in the ERF. Since that time, the Army and other federal and state agencies have been involved in identifying the cause of the waterfowl mortality problem. By 1991, it was concluded that unoxidized white phosphorus (WP) particles within the ERF sediment were causing waterfowl mortality. This concern has stimulated efforts toward the development of an effective repellent to reduce or eliminate waterfowl mortality caused from WP in ERF. This study evaluates a methyl anthranilate (MA) bead formulation in a simulated pond setting to determine the effects on mallard feeding behavior and mortality of mallards feeding in a WP contaminated area on ERF. The experiment was conducted between 0800 and 1600 h for a 7-day pretreatment and a 10-day treatment period. The bead matrix was designed to settle to the bottom of the pool and only release MA when broken by feeding mallards. The bead formula was applied at 21-7 kg/ha or about 7 beads/cm² so that mallards would encounter it when feeding off the bottom. It was effective in reducing time mallards spent in pools ($P \leq 0.01$). The average number of minutes mallards spent in pools decreased to below pretreatment levels. Field tests in a WP contaminated area on ERF with the same formulation and application rate indicates that mortality to ducks continuously exposed to WP contaminated sediment was about 60% lower in treated pens within the first 24 h posttreatment. At the conclusion of the test, 144 h posttreatment, mortality was 50% lower in treated pens. In a free-ranging situation, it is anticipated that the relative risk of poisoning in MA treated areas would decrease if ducks could leave the area.