Effects of Fish Restoration Practices on Amphibians in Yellowstone National Park, Wyoming

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Throughout the Western United States, fisheries managers are attempting to restore native cutthroat trout (Onchorynchus clarkii) populations by removing nonnative fish species. A new formulation of the EPA approved piscicide rotenone (CFT Legumine) is increasingly being used as a method to accomplish this removal. Because fish restoration projects bring about an abrupt change to aquatic environments, it is important to consider their immediate and long-term effects on non-target species, such as amphibians. We assessed the effects of fish removal on amphibians in Yellowstone National Park (YNP) by investigating the toxicity of rotenone to and the long-term impacts of removing fish on local amphibian populations. CFT Legumine (5% rotenone) was applied to High Lake in YNP (2006) to remove stocked Yellowstone cutthroat trout (O. c. bouvieri). To determine toxicity, amphibian surveys were conducted immediately prior to the treatment to obtain pre-treatment tadpole population estimates. Post-treatment surveys were conducted both immediately, for assessing treatment-related mortality (during and after application), and 1, 2, and 3 years following to obtain tadpole abundance estimates in the years after application and to address the long-term effects of fish removal and reintroduction. The results of the toxicity trials revealed that in the 24 hrs following application, rotenone was lethal to gill-breathing amphibian tadpoles and non-lethal to non-gill breathing metamorphs, juveniles, and adults. In the years following, tadpole repopulation occurred at levels above the pre-treatment abundance estimate, though both tadpole abundance and distribution appeared correlated with fish presence.