



# Fisher Toxicant Fact Sheet

## *Rodenticide (Rat Poison) exposure in West Coast Fisher populations*



*A pair of young fisher kits.*

Photo Credit: Cathy Raley, USDA Forest Service, PNW Research Station

### What are Anticoagulant Rodenticides (ARs)?

Anticoagulant rodenticides (ARs) act by interfering with liver synthesis of vitamin K-dependent blood-clotting factors and damaging the small blood vessels. Symptoms of anticoagulant exposure are bleeding from the nose and gums, extensive bruises, anemia, fatigue, behavioral changes, and difficulty breathing. Some of the ARs require multiple doses over a number of days before they affect blood clotting severely enough to cause symptoms in most individuals. However, susceptibility to the ARs varies among individuals and among species. Pregnant female fishers are considered especially at risk. Reproductive effects include maternal bleeding and death, spontaneous abortion, and fetal deformities. ARs can also be transferred to kits through nursing (mothers-milk).

### How are fishers coming into contact with ARs?

ARs are commonly used to control rodents in urban and agriculture areas. Wildlife exposure to ARs has been widely documented in California, leading to the recent ban of sales of the more persistent ARs to the general public. The origin of the ARs in wildlife is unknown, but given the geographic extent, number of different species involved, and the number of AR compounds found within some individuals, it is likely that there are many different sources.

Federal biologists identified the use and prevalence of ARs within fisher habitat as a major threat to the species. The West Coast DPS fishers dwell in low-to-mid elevation forests, and are often found in remote places, such as the Southern Sierra Nevada Mountains and the Klamath Mountains of northern California and southern Oregon.

Rodenticide exposure in fishers appears to be widespread in fisher populations. To date, published research indicates that of the 58 fisher carcasses studied in the Klamath Mountains and in the Southern Sierra Nevada, 79 percent tested positive for the toxin. Fishers in the Olympic Peninsula in Washington also have tested positive for AR exposure.

### What evidence exists that marijuana cultivation sites are a significant threat?

Large quantities of ARs have been found at illegal marijuana cultivation sites within occupied fisher habitat on public, private, and tribal lands in California. ARs are found in significant amounts scattered around young marijuana plants to discourage forest-dwelling rodents from feeding on the leaves of these plants at marijuana cultivation sites. ARs also have been found along plastic irrigation lines to poison rodents that might chew on the plastic lines that serve as a water source at marijuana cultivation sites. Fishers may be eating rodenticide bait directly if it is not contained within bait stations and is scattered on the ground instead. They could also accumulate lethal amounts of ARs if they ate enough contaminated rodents. Rodents that



*Pristine forests near Hoopa, CA covered with trash, including bait traps and anti-coagulant rodenticide packaging.*

Photo Credit: Mourad Gabriel, PhD



*Rodenticides discovered around the base of marijuana plant in a trespass grow site in a remote forest in Northern California.* Photo Credit: Mourad Gabriel, PhD

consume the bait and survive will retain some of it in their tissues for weeks or months. In addition to foraging on bait at the site where it is applied, rodents may cache bait pellets, dispersing it from the application site. This can result in the rodent consuming small sublethal portions over extended time periods. The proximity of a large number of marijuana cultivation sites to fisher populations in California and Oregon (See Map Image below) have led researchers to implicate marijuana cultivation sites as the likely most significant source of AR exposure in fishers.



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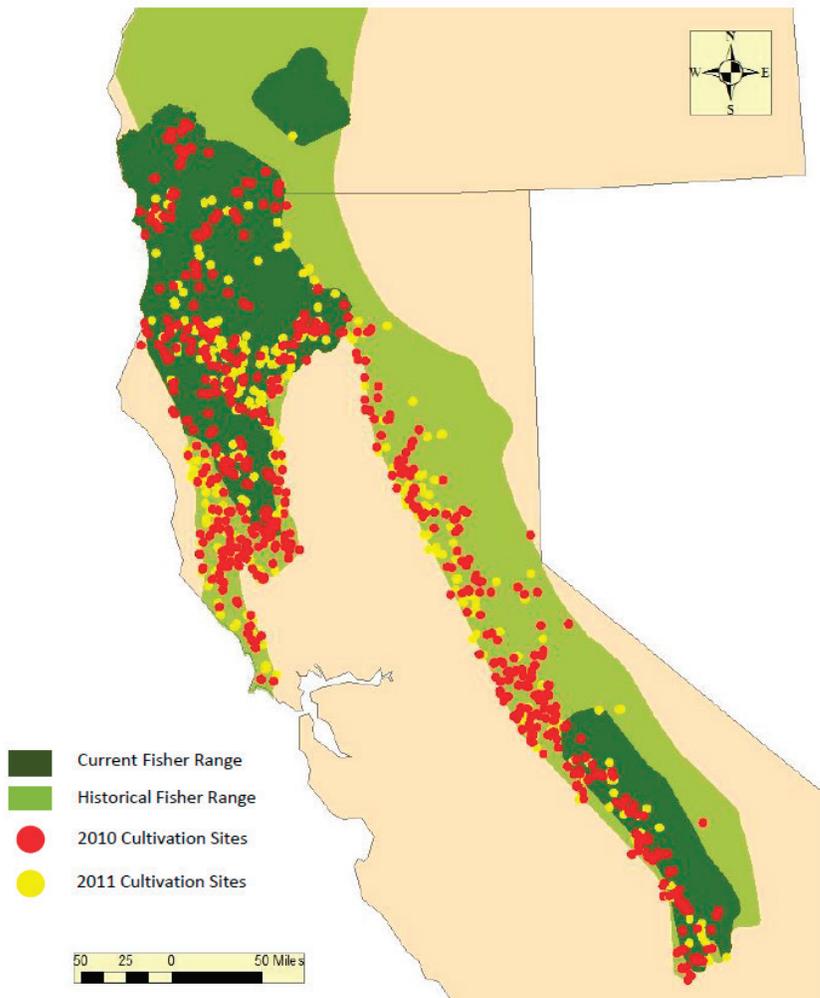


Figure 1. Marijuana cultivation sites eradicated on public, tribal or private lands during 2010 and 2011, within both historical and current ranges of the fisher in California and southwestern Oregon. The central location for each eradicated illegal marijuana cultivation location is buffered by a 4000-meter radius which approximates a hypothetical home range of a male fisher. Figure from Higley et al. 2013a.

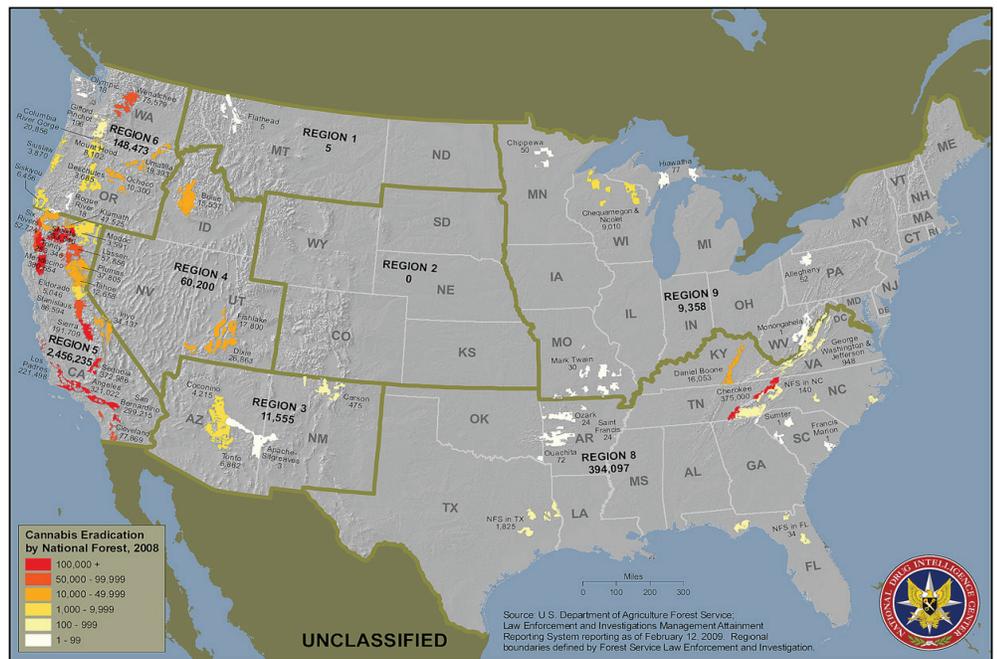


Figure 2. Cannabis (marijuana) eradication effort (number of plants) by National Forest in 2008.