

*Upper Truckee R.  
El Dorado Co*

STATE OF CALIFORNIA

DEPARTMENT OF FISH AND GAME

INTRAOFFICE CORRESPONDENCE

DATE: September 23, 1958

TO: Warden Jim Lesmon  
P. O. Box 402, Tahoe Valley

FROM: Dave Joseph, Water Projects Section

SUBJECT: Herbicides for Possible Use in Plant Eradication - Upper Truckee Drainage,  
Lake Tahoe Area.

In response to the call from Almo Cordone on September 23, re. the subject plant control problem, I have obtained the following information.

Generally speaking there is relatively little concerning the toxicity to fish which may be caused by chemicals used to eradicate terrestrial plants. The only readily available information that we have on the subject is contained in Game Bulletin No. 7, "Pesticides: Their Use and Toxicity in Relation to Wildlife." I will outline what we have regarding the chemicals specifically mentioned by Al Cordone over the phone.

1. 2,4-D. Used in the control of broad leaved herbaceous plants. Some woody species of plants are susceptible and care must be exercised to prevent drift of the chemical to desirable plants. One half pound to two pounds per acre is the normal range of application. Some toxicities to fish have been reported as follows: The safe limit for minnows reported at 1,500 parts per million, the safe limit for sunfish and catfish at 500 ppm. Some mortality of bass is reported at 100 ppm and of carp at 65 ppm. No information regarding mortality to salmonids.
2. Kiron (2,4-d plus 2,4,5-T). 2,4,5-T is closely related to 2,4-D and frequently the two compounds are used in combination. 2,4,5-T is generally more useful on brushy or woody vegetation. It is somewhat more toxic to mammals than 2,4-D. No information is given regarding its toxicity to fish but it may be reasonable to assume that 2,4,5-T + 2,4-D(Kiron) is at least as toxic to fish life as 2,4-D alone.
3. Borate, (Polybor-chlorate). This compound is sodium chlorate with Borax added to reduce the inflammability. Borate is a soil sterilizer generally used to control the emergence of undesirable plants from the seed or sprout stage. It is relatively non-toxic to mammals when used at normal concentrations which are effective on plants. Fish however, may be

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quite susceptible to it. Aquatic animals are destroyed at 20,000 to 40,000 ppm, the level necessary to kill submerged aquatic plants. Daphnia, the water flea, has been reported immobilized and presumably killed at concentrations of 4,240 ppm.

This compound is applied in rather heavy concentration directly to the soil. If used in the fall of the year prior to any significant wetting of the soil there is some danger that heavy rainfall could wash it to lower ground before it could leach into the soil.

4. CMU. This is a new herbicide which is applied to the soil in the same manner as Borate. It is a soil sterilant at 10 to 80 pounds per acre and prevents the emergence of plants when applied at the rate of 1 to 3 pounds per acre. CMU has been reported toxic to goldfish at concentrations of 59.5 ppm. Golden shiners are reported to react adversely to concentrations of between 9 and 20 ppm. It is reported, however, that CMU will kill water weeds at concentrations that are safe to aquatic animals.

The primary danger when using this compound would be run-off due to heavy rain before the compound could penetrate into the soil.

I'm sure you can see by now that we know very little about these compounds in relation to fish life. The information regarding toxicities could be easily obtained by performing bioassays, but unfortunately we have neither the manpower nor facilities to perform bioassay work at this time.

Which ever of these compounds is used by the subdivider, it does not appear likely that damage will be caused to aquatic life provided that proper precautions are exercised. However, since we don't know exactly how he is going to operate, we should certainly not put ourselves in the position of sanctioning his operation. If damage is caused, he could certainly be held liable.

Dave Joseph  
Marine Biologist IV

cc - Don Kelly, Region II ✓