State of Idaho
Department of Fish and Game
Boise, Idaho

December 19, 1996

FIS

MEMORANDUM

TO: Distribution List

FROM: Sharon W. Kiefer, IDFG SWK

SUBJECT: wand comparison

CC: Rogers, Duke, Hassemer

The attached summary is a comparison of tube and hand-held wand CWT detectors. The information was collected jointly by Dworshak National Fish Hatchery, Idaho Fisheries Research Office, and Idaho Department of Fish and Game personnel. We conducted the comparison on adult steelhead last spring. The comparison was part of our effort to ensure that detectors are efficient on larger steelhead, because IDFG is not using a fin flag for A-run steelhead bearing a CWT. A-run steelhead bearing a CWT without a fin flag first returned to Idaho this fall, and will arrive at hatchery racks during spring, 1997.

You were on the list as someone who might be interested in what we found.

List:
Northwest Marine Technology
Blankenship, Schuck, Mendel, WDFW
Roseberg, IFRO
Herrig, LSRCP
Zakel, ODFW

DETECTION RATE COMPARISON OF TUBE AND WAND CODED WIRE TAG DETECTORS ON B-STRAIN STEELHEAD AT DWORSHAK NATIONAL FISH HATCHERY, SPRING 1996

During spring 1996 steelhead spawning operations at Dworshak National Fish Hatchery, a study was undertaken comparing the detection rates of two different models of coded wire tag (CWT) detectors made by Northwest Marine Technology of Shaw Island, Washington. In addition to comparing the different detector types, the study was also done to test whether the hand wand unit could accurately detect CWT's in large, sexually mature male steelhead. Various personnel from the hatchery, the Idaho Fisheries Research Office (IFRO), and Idaho Department of Fish and Game participated in the three-month long study period.

On most spawning days at the hatchery during February, March and April, one tube detector and both wands were used to detect CWT's in adult B-strain steelhead. Two different models of tube detectors were used: an R-8 (in the data referred to as the "New" model) and an older R-10 model (the "Old" tube). The two tube detectors were used on alternate spawning days. Two hand held wand detectors (same model) were used every spawning day. Each fish was tested with one tube detector and then one wand detector. Various personnel handled both the tube and wand detectors to ensure that both methods were unbiased i.e. that anyone could use either CWT detector type and accurately detect the presence of CWT's. Snouts were excised from all fish that produced a positive detection signal in either the tube unit, the wand, or both.

Thirteen spawning days were included for this study. In that time, 1,805 steelhead (including 65 steelhead hauled from Kooskia National Fish Hatchery) were checked with both the tube and wand detectors. On some days, additional fish were checked with only one of the two devices, but these fish were not included in this study.

Of the 1,805 fish checked with both types of detectors, 174 steelhead yielded CWT's. The tube and wand units accurately detected 170 (97.7%) of the CWT's. The remaining four tags (2.3%) were detected by one detector type but not the other. Three CWT's were detected by the tube, but not the wand. This yields a tube detection rate of 99.4%. Conversely, one CWT was found by the wand, but not the tube, giving the wand units a detection rate of 98.3%. Based on this study, it appears that the tube type detector is only slightly more accurate in detecting CWT's -- 173 detections out of 174 total. The wand ranked slightly behind the tube -- 171 out of 174 total wire tags. While the tube detector seemed to produce slightly better results in this hatchery study, it also gave more "false positives" (e.g. positive detection signals) than the wand. Nineteen fish triggered positive detection signals from either the tube or wand detectors, but yielded no wire tags -- a "no show" rate of 9.8%. Eight of these fish produced positive detection signals from both the tube and wand detector, and 11 fish produced detections in the tube unit, but not the wand. None of these 19 fish tripped the wand detector and not the tube. These extra no tag detections by the tube may result from a difference in the methodology used by the two detector types. Using the tube detector, the entire fish body was passed through the tube. A fish hook or other metal fragment on or in the fish carcass could have triggered the tube detector. The wand detection method consisted of sweeping the unit sideways along the skin in the head area, beginning at the snout and moving posterior to the eyeball area. Hence, unless a hook or other metal fragment was located near the head and snout area, the wand would probably not pick up the metal piece.

Ralph Roseberg, IFRO fishery biologist assisting in the study, commented that the wand detections did not seem as consistent or as easy to use as the tube detector method. He noted that during this study, one wire tag would have been easily missed if the operator had been relying on an audible beep to signal a detection.

"(On) one occasion, a weak wand signal (the light blinked, but no beep) was produced, but the tube produced a beep. An inexperienced wand operator might have missed this tag... If the wand is used as the sole sampling device, a full-time experienced operator is highly recommended. The tube can (be) used by virtually anyone and does not require an extra person as the wand does," he said.

Roseberg also pointed out an interesting result in one of the four CWT'ed fish that signalled a tag with one detector type and not the other. On a small sized (64 cm fork length) male steelhead, the wand did not detect the CWT, but the tube did. In practice, one might expect the wand to miss a CWT in a large male steelhead that's undergone sexual dimorphism. In a large steelhead of this sort, the tag might be more deeply inbedded in the tissue mass of the head area to be accurately detected. He found it surprising that the wand did not pick up the tag from such a small male steelhead.

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December 16, 1996