**Study #:** BatchXXX

**Drug:** Aqui-S 20E (eugenol)

**Was treatment initiated?** (YES)

**TREATMENT INFORMATION AND SCHEDULE**

DATE USED AMOUNT USED

6/3/20 3 mL

6/19/20 4 mL

7/1/18 3 mL

7/2/18 3 mL

7/20/18 2 mL

7/29/18 2 mL

8/3/18 2 mL

8/18/18 1 mL

8/19/20 7 mL

8/21/20 6 mL

9/1/20 7 mL

9/3/20 7 mL

9/16/20 5 mL

9/17/20 6 mL

Total Used in Study: 58 mL

**Reporting Individual:** Erik Schoen

**Fish Species Treated:**  Chinook salmon

**Disease Treated/Treatment Objective:** Anesthesia

**If Other Disease/Objective, Please Specify:** N/A

**Drug Dose (1 to 100 mg/L):** 20-25 mg/L

**Average Fish Weight:** 2.4 g

**Average Fish Length:** 59 mm

**Number of Fish per Rearing Unit:**  N/A

**Number of Treated Rearing Units:** N/A

**Total Number of Treated Fish:**  1258

**Number of Control Rearing Units:** N/A

**Total Number of Control Fish:** N/A

**Date Treatment Initiated:** 6/3/20

**Date Treatment Ended:** 9/17/20

**Number of Treatment Days:**  14

**Study Protocol Objective:** Aqui-S 20E – collect weight and length data as part of an ongoing study examining Chinook salmon drift-feeding conditions in the context of effects from wildfires and climate change.

**Study Design:** Chinook salmon are a critical subsistence resource for many communities along rivers in the boreal forest region of Alaska. The effects of changing wildfire regimes in this region on the productivity of salmon and their habitats are poorly understood, particularly within the context of other climate-driven changes. In the short term (0-5 years), wildfires can affect habitat quality for salmon though changes such as increases in water temperature, changes in invertebrate-based food supply, and increased erosion of fire scars. Erosion leads to elevated sediment loads, turbidity, and fine drifting debris, which juvenile Chinook salmon spend energy pursuing instead of prey. These changes may affect the survival of Chinook salmon directly during their spawning, egg incubation, and juvenile rearing life stages, as well as indirectly through changes in juvenile growth rates. In turn, juvenile growth can be an important determinant of survival during subsequent life stages due to size-selective mortality in fresh water and in the ocean.

Two recent burns within the well-studied Chena River watershed provide a valuable opportunity to estimate short-term effects of wildfire on Chinook salmon and their food supplies. The Chena River is home to second-largest known population of Chinook salmon in the Yukon River basin, based on long-term average spawning escapement. This project will measure differences in juvenile Chinook salmon growth and environmental conditions related to their feeding success within two mainstem reaches and investigate how fire directly impacts feeder streams via the food and detritus they provide, during summer 2020.

**Objectives**

1. Measure the short-term effects of the 2019 Nugget Creek and Beaver fires on the rearing habitat quality and juvenile growth rates of Chinook salmon in the Chena River
2. Measure short-term wildfire effects on invertebrate prey communities and detritus loading from feeder streams that influence downstream Chinook salmon habitats
3. Investigate the feasibility of using drone-based aerial imagery to estimate river turbidity levels upstream and downstream of the burned area, as a step towards development of a rapid-assessment tool for estimating effects of other wildfires on habitat quality for salmon

**Disposition of Treated Fish (Human Food Safety Considerations):** NA

**Worker Safety Considerations:** Latex gloves provided

**AVERAGE WATER QUALITY PARAMETERS DURING TREATMENT PERIOD**

**Temperature:** 7.0° Celsius

**Dissolved Oxygen (mg/L):** N/A

**pH:** N/A

**Hardness – CACO3 (mg/L):** N/A

**ANESTHETIC DRUGS**

**Level of Anesthesia:** Moderate sedation for weight and length measurements

**Approximate Fish Age:** 0 years

**Number of Fish/Bath:** 3-6 fish

**Treatment Bath Vol. (gal):** 1 gal

**Duration of Treatment (min):**  3 min

**ANESTHETIC RECORD**

(see spreadsheet)

**RESULTS**

**Description of Results:** Aqui-S 20E worked well as an anesthetic for weight and length measurements on juvenile Chinook salmon in the Chena River, interior Alaska. Aqui-S 20E did not always properly anesthetize a particularly energetic fish within the expected dosage or timeframe. As a result, an additional amount (1mL) of the anesthetic was added to the treatment bath, or fish were held in the treatment bath slightly longer until proper sedation level was achieved. Some fish required slightly longer recovery times. Overall behavior in the treatment bath during anesthetization was slowed, minimal movement with some fish turning ventral side up, and in recovery, fish regained normal opercular movement and swimming. Water temperature was kept as constant and close to the river’s temperature as possible, and no mitigating environmental conditions appeared to have impacted treatment results. There were no deviations from study protocol.

**In your opinion, was the study successful?:** Yes

**Toxicity observations – Report any apparent drug toxicity including a description of unusual fish behavior:** None

**Required withdrawal period met:** Yes

**Number of days before availability of fish for human consumption:** NA – catch and release project; juvenile Chinook salmon are not harvested in any fisheries.

**Pathology report included:** None

**Disposition of unused drug:** Unused drug is stored on-site at University of Alaska Fairbanks, Institute of Arctic Biology.