**Study #:** BatchB580

**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 and chum 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 fork length

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

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

**Total Number of Treated Fish:**  1272

**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 data to establish the effectiveness of AQUI-S 20E as an anesthetic in a variety of fish species under a variety of environmental conditions.

**Study Design:** Climate change is likely to challenge Chinook Salmon (*Oncorhynchus tshawytscha*) in the Yukon River basin with increased water temperature and streamflow. Historically, Chinook population productivity has declined in years with sustained high flow during the period when juvenile Chinook are feeding in freshwater, probably due in part to reduced prey consumption and growth. Because the optimal temperature for growth of juvenile Chinook Salmon is much lower when they are food-limited than when they are well-fed, determining the likely response to a warming climate requires understanding how conditions for prey consumption vary with streamflow. Therefore, this project proposes to quantify spatiotemporal and flow-related variability in the concentrations of drifting prey and distracting debris in the Chena River basin, one of the major Chinook producers in interior Alaska and the watershed most heavily impacted by human development in the region. Locally-tested foraging and bioenergetics models will connect these measurements to field-validated juvenile growth predictions under current and projected future climatic conditions. These results will inform organizations restoring impacted habitat with finite resources about which areas have the requisite thermal and foraging conditions to support more juvenile Chinook Salmon if other habitat qualities such as cover and connectivity are improved.

**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:** Light sedation for weight and length measurements

**Approximate Fish Age:** 0 years

**Number of Fish/Bath:** 1-155 fish (≤ 15 fish in bath at any one time)

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

**Duration of Treatment (min):**  2-5 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. A small number of juvenile chum salmon were also captured and anesthetized before they could be positively distinguished from Chinook salmon. Fish generally took between 2 and 5 minutes to reach the desired level of light anesthesia necessary to collect accurate length and weight data. Fish generally recovered within 5 minutes or less. Fish in the treatment bath during anesthetization exhibited slowed swimming and opercular movement, with some fish turning ventral side up. In recovery, fish regained normal opercular movement and swimming. There were no deviations from study protocol. 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 and chum 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.