

MEMORANDUM

Date: August 30, 2012
To: Water Right File 98-7684
From: csaxton
Re: POU

POU Shape limited to facilities constructed during the authorized development period.

Volume and Turnover

Date: 8/30/2012
Prepared by: Craig L. Saxton
Water Right #: 98-7684

# of Tanks	Length		width		Height		Turnover per day	Volume Cubic Feet	Year constructed
	Meters	Feet	Meters	Feet	Meters	Feet			
2	3.66	12.0	0.36	1.2	0.45	1.5	15	229280	1992 pg 8
1	3.66	12.0	0.56	1.8	0.3	1.0	15	118886	1992 pg 8
1	3.09	10.1	0.37	1.2	0.47	1.5	15	103896	1992 pg 8
10	1.2	3.9	0.6	2.0	0.4	1.3	15	556842	1992 pg 8
3	1.2	3.9	0.45	1.5	0.57	1.9	15	178537	1992 pg 8
2		30		5		4	15	6570000	1994 pg 5
7757440									

# of Tanks	Diameter				Height	
	Meters	Feet			Meters	Feet
3	3.06	10.0			1.53	5.0
3	1.53	5.0			1.22	4.0

Volume
 Cubic Feet
 2175520
 433682
 2609202

10366642 Cubic Feet

238.0 AF

State of Idaho
Department of Water Resources

Reference Map

98-7684

This map depicts the FISH PROPAGATION place of use boundary.
and is provided for illustrative purposes.

R01E



0 0.035 0.07 0.14 Miles

-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters



Kootenai River White Sturgeon Conservation Aquaculture Program 1990-2007

2nd Edition



Kootenai Tribal Sturgeon Hatchery
Kootenai Tribe of Idaho
P.O. Box 1269
Bonners Ferry, ID. 83805



Kootenay Trout & Sturgeon Hatchery
Freshwater Fisheries Society of British Columbia
4522 Fenwick Road
Fort Steele, BC. V0B 1N0



Administered by the Kootenai Tribe of Idaho through a contract from the Bonneville Power Administration as part of the Northwest Power and Conservation Council's Fish and Wildlife Program (Project 198806-400, Contract No. 30729).



Hatchery Facilities

Kootenai Tribal Sturgeon Hatchery

The Kootenai Hatchery (Figure 13) is located three miles west of Bonners Ferry, Idaho on the banks of the Kootenai River at mile 150 (km 241). The hatchery was built expressly for sturgeon conservation and also produces rainbow trout to feed adult sturgeon broodstock while briefly in the hatchery. The hatchery includes water intake, water treatment, adult holding, egg incubation, and juvenile rearing facilities as well as an office, crew quarter, and shop/garage (Figure 14). The main hatchery building houses circular tanks where female broodstock are held between capture and spawning. A boat dock and ramp provides direct access to and from the river for transfer of adult broodstock captured in nearby spawning areas. The main building also houses incubation jars, larval collection troughs, and small circular and rectangular tanks for fry and fingerling rearing. Larger juveniles are transferred into larger circular tanks in the rearing shed.

The hatchery has the capacity to spawn 6-12 females per year, incubate up to 25,000 eggs from each of 12 families, and rear up to 3,000 juveniles per family to 0+ years of age or 1,000 juveniles per family to 1 or 2 years of age. The net rearing capacity is 6,000 to 12,000 lb at a rearing density of 0.5 lb per cubic foot of rearing area. Rearing facilities provide the capability to separately rear different family groups in order to monitor and evaluate success and provide the capability to balance contributions at release.

The primary water source is filtered Kootenai River water. Prior to the completion of the hatchery upgrade in 1999, municipal water was used for incubation and early rearing. The water intake is adjacent to the hatchery. Water is filtered to remove particulates and disinfected with ultraviolet light. Past attempts at incubation and hatching using ambient unfiltered river water resulted in high mortality rates due to siltation and fungus. Current incubation and rearing systems divert water into a separate system for disinfection and temperature control. A heat exchange system is used to regulate incubation, hatching, and early rearing water temperatures to 12 or 13°C between June and September. Adult broodstock and rearing systems use ambient river water which ranges seasonally in temperature from 1 to 18°C. Hatchery water is used in a single pass system and discharged into a drain field.



Figure 13. Kootenai Tribal Sturgeon Hatchery. (Photo courtesy of Kootenai Tribe of Idaho)

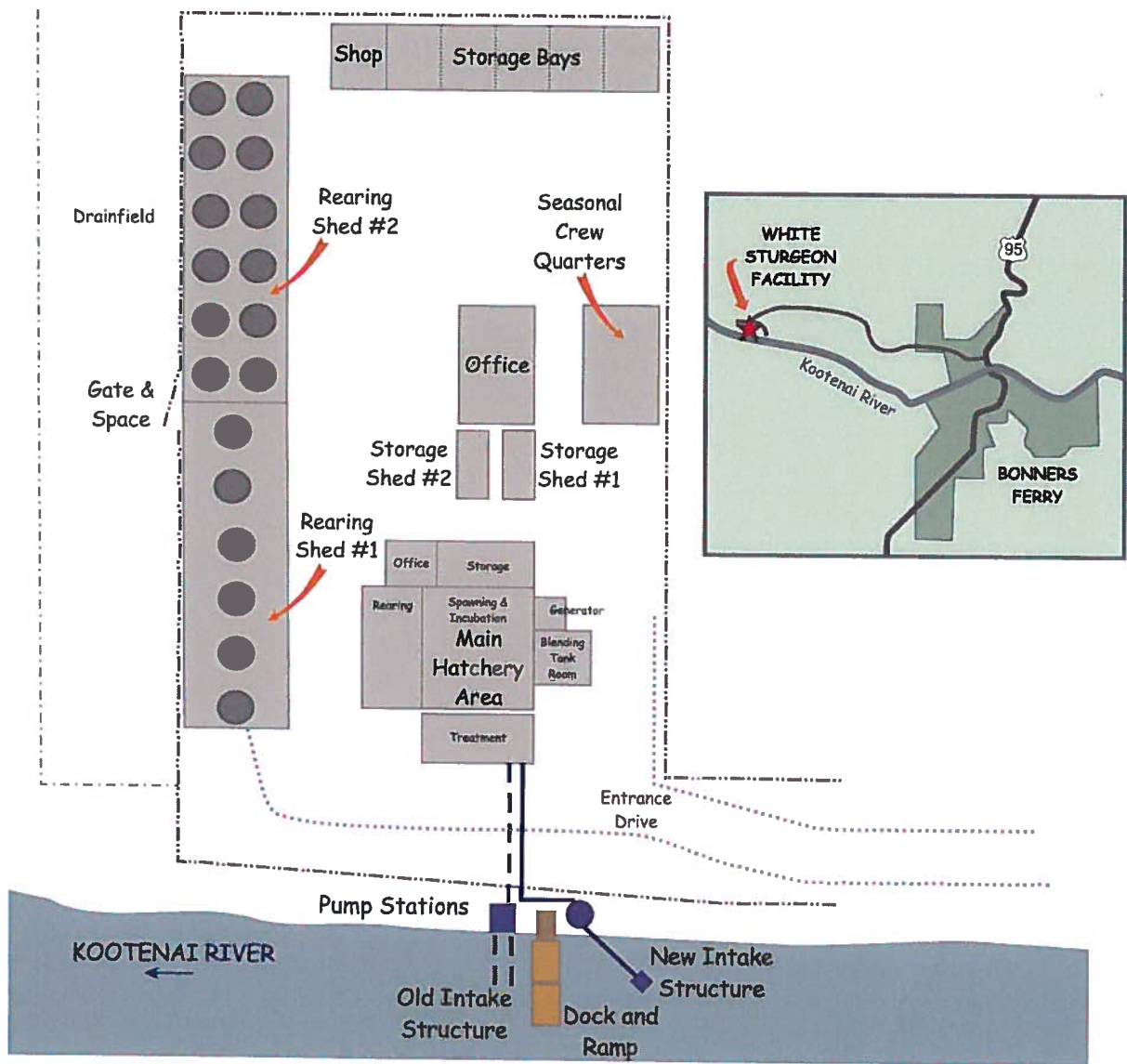


Figure 14. Map of the Kootenai Tribal Fish Hatchery facilities.

The facility includes a series of backup water supply and power systems for use in case of electrical or facility emergencies. Hatchery personnel are on call at all times in on-site crew quarters or residences in adjacent residences. Alarms are connected to water temperature, water pump, head tank, power, filter, and disinfection systems.

Table 2. Vital statistics of Kootenai sturgeon hatchery.

Facility	Description
Operator	Kootenai Tribe of Idaho
Address	P. O. Box 1269, Bonners Ferry ID 83805
Hatchery grounds	2.0 acres
Buildings	Main hatchery building (3,125 ft ²), Rearing shed 1: 2,880 ft ² , rearing shed 2: 2,880 ft ² , Office (1,250 ft ²), crew quarter (1,125 ft ²), shop/garage (2,880 ft ²)
Water intake	Two 12" intake pipes 24" diameter by 24" long stainless steel wedge wire intake screens Screens located 5 and 15 ft above the river bottom Screen velocity limited to 0.4 ft. per second Three solids handling submersible type intake pumps (20 hp) in on-shore wet well 3-500 gallon per minute capacity per pump (at 125 feet of total dynamic head) Delivery to treatment building 8" ductile iron underground pipe Separate back-up pump station Municipal water source with in-line activated carbon filters
Water treatment	Seven 55-inch diameter pressure sand filters with automatic backwash functions Amiad filters Three ultraviolet disinfection units piped in parallel, each with a 250 gpm 50,000 microwatt/cm ² dosage rate @ a 90% UV transmission efficiency Heat exchanger for incubation system using well water and natural gas fired boiler
Adult holding	3 covered circular fiberglass tanks (15 ft dia x 4 ft deep) Water exchange rates of 10-15 volumes per day to maintain oxygen levels at 5 mg/L
Incubation	24 MacDonald Jars (13 L, round bottom cylinders, 20 cm in diameter) Water exchange rates of 30-40 gallons per minute 12 Rectangular fiberglass fry collection tanks (1.2 m x 0.56 m x 0.31 m deep)
Rearing	12 rectangular tanks (2.44 m long x 0.56 m wide x 0.31 m deep) for larvae 15 circular tanks (from 1.02 m dia x 0.43 m deep to 1.42 m dia x 0.76 m deep) for fry and fingerlings 12 3.0 m dia circular rearing tanks Six 4.5 m dia circular rearing tanks Rearing densities below 0.5 lb of fish per ft ³ of water
Power supply	3-phase municipal power supply automatic generator backup (100-kw natural gas) Secondary generator for back-up pump station (40-kw diesel)
Fish transport	Insulated, oxygenated 120-250 tanks

Release

Juvenile sturgeon are typically reared for up to 1 to 2 years in the hatchery before release at sizes averaging 6-12 in (150-300 mm) and 6-15 fish/lb (30-60 g/fish). Release sizes were selected to maximize survival opportunities in the wild, limit the need for hatchery space to simultaneously hold cohorts from many brood years, minimize time in the hatchery which could risk domestication, and allow fish to reach sizes large enough so that they could be individually marked with PIT tags.

Fish are released in the spring or fall after reaching sizes suitable for tagging. Fall releases are typically age 1+ fish which include the faster growing individuals from a brood year cohort. Smaller fish from the same brood year are typically retained in the hatchery and released in the following spring as two-year-old fish. Fish are transported to release sites by tanker truck or in some cases by boat. Fish are loaded and unloaded from tanks and livewells by dip net.

Releases are distributed over a 110 mi (180 km) area from Kootenay Lake to the Montana border (Figure 24). Transboundary transport limitations result in local release of fish reared by each hatchery. Fish are distributed to colonize all suitable habitats and avoid local concentrations that might increase competition or predation. Releases directly into Kootenay Lake have been discontinued in case juvenile imprinting affects future spawning migration behavior. Future releases may be expanded to include Montana waters downstream from Kootenai Falls to take advantage of habitat throughout the historic range, and provide opportunities for potential imprinting to upstream areas where more favorable spawning habitats appear to exist.



Figure 23. Liberation of juvenile white sturgeon reared at the Kootenay Trout and Sturgeon Hatchery. *(Photo courtesy of Colin Spence, BC ME, Nelson, BC).*