



Strawberry Creek Salmon Spawning Facility: 2016 Summary

Nick Legler*, Emily Kurszewski & Lydia Doerr
Wisconsin Department of Natural Resources
110 S Neenah Avenue, Sturgeon Bay WI, 54235
*920-746-5112, nicholas.legler@wisconsin.gov



Photos: Sign at entrance to Strawberry Creek Salmon Spawning Facility (left, 2015); Strawberry Creek Facility (middle, 2012); Processing Chinooks at Strawberry Creek (right, 2014) with volunteer Rick Hanney sorting fish (front), DNR fisheries technician Tim Kroeff collecting bio-data (middle), and USFWS technician Zach Kleemann collecting CWT snouts (back).

Basic Introduction: The Strawberry Creek Salmon Spawning Facility is a Chinook salmon egg collection facility located in Sturgeon Bay, WI. Strawberry Creek is the primary source of Chinook salmon eggs for WI DNR hatcheries, and typically 100% of WI DNR's eggs for hatchery production of Chinooks are collected at Strawberry Creek. Each spring, fingerling Chinook salmon are briefly reared in a pond at Strawberry Creek. This is a flow through pond filled directly with creek water to help with imprinting (i.e., this helps young Chinooks recognize the stream, so they'll return as mature adults). Chinooks released from the pond into Strawberry Creek swim about 0.4 miles downstream to the Bay of Sturgeon Bay and out to Lake Michigan. During October, mature adult Chinooks return to Strawberry Creek for spawning. Eggs are collected and fertilized at Strawberry Creek and then transferred to state fish hatcheries for incubation, hatching, and rearing. Recently, the Wild Rose State Fish Hatchery has produced all or most of the Chinook salmon stocked annually into Wisconsin tributaries to Lake Michigan. Additionally, a lifecycle characteristic of Pacific salmon including Chinook is that they typically spawn once and then die. Many salmon carcasses collected at Strawberry Creek are distributed to contractors (e.g., for fertilizer or animal feed), food pantries, and raptor rehabilitation centers. Extra eggs not needed for hatchery production are also collected by a contractor for resale as fishing bait. Education and outreach are important at the Strawberry Creek Salmon Spawning Facility too. Many tours are held at Strawberry Creek each year including school classes, Boy Scout troops, and retirement groups. Visitors and volunteers are common and welcomed.

Spring 2016 Overview: Approximately 121,275 Chinook salmon fingerlings with adipose clips and coded wire tags (CWTs) from the Wild Rose State Fish Hatchery were stocked into a rearing pond at Strawberry Creek on April 28, 2016. These Chinooks were reared in the pond for 5 weeks and released on June 1. Rearing activities involved feeding 2-3 times daily, monitoring pond conditions (i.e., temp, dissolved oxygen), and routine pond maintenance. To release the Chinooks, a seine was used to direct the Chinooks out of the pond and into the creek.

Strawberry Creek Salmon Spawning Facility: 2016 Summary

Fall 2016 Overview:

A total of 2,859 live Chinook salmon were sacrificed and processed for biological data at Strawberry Creek during October 2016 and over 1.8 million eggs were collected for the WI DNR Wild Rose State Fish Hatchery (Table 1). Data collected were lengths (mm), weights (g), gender, lamprey scars, and fin clips. Snouts were also collected from most adipose clipped Chinooks to recover embedded coded wire tags (CWTs). A routine fish health inspection was conducted on October 11th. Overall, sufficient numbers of Chinook salmon eggs were collected from Strawberry Creek during 2016 to meet WI DNR's hatchery production goals, and additional eggs were also collected for MI DNR.

A water pump typically used during fall operations at Strawberry Creek to supplement stream flow was operated from September 30 to October 20, but mechanical issues caused the pump to be shut down for 6 partial and 3 full days from October 2-10. Even without the pump, the water level in Lake Michigan was up, standing water in Strawberry Creek was high, and collectively water depths were sufficient for Chinook salmon to easily access the creek and swim upstream.

Most Chinook carcasses and unused eggs from Strawberry Creek during 2016 were distributed via contracts to be processed commercially as fertilizer and fishing bait. A total of 18,800 pounds of fish were purchased for fertilizer. Eggs totaling 1,875 pounds were purchased for fishing bait. Fish totaling 6,000 pounds were donated to local food pantries and raptor rehabilitation centers.

Table 1. Numbers of live Chinook salmon sacrificed and processed for data, females spawned, and eggs collected at the Strawberry Creek Salmon Spawning Facility during fall 2016. Every fish wasn't always removed from the pond each day, and instead unprocessed fish were sometimes saved for future egg collections.

Date	Chinooks Processed	Females Spawned	Eggs Collected
Mon October 3, 2016	218	63	303,075 (Wild Rose)
Thurs October 6, 2016	573	100	514,063 (Wild Rose)
Tues October 11, 2016	918	100	516,370 (Wild Rose)
Mon October 17, 2016	343	100	485,576 (Wild Rose)
Thurs October 20, 2016	843	100	521,479 (MI DNR)
Total	2,895*	463	1,819,084 (Wild Rose) & 521,479 (MI DNR)

*In addition to these 2,895 Chinooks processed for data, approximately 152 dead and live Chinooks were only counted after being removed from the pond and stream (2,895 + 152 = 3,047).

Fall 2016 Biological Data:

Basic biological data collected from 2,859 Chinook salmon at Strawberry Creek during October 3-20, 2016 is summarized here. Total length for male Chinook salmon ranged from 312 mm (12.3 inches) to 1,078 mm (42.4 inches) and averaged 855 mm (33.7 inches; Figure 1a). Total length for female Chinooks ranged from 600 mm (23.6 inches) to 1,072 mm (42.2 inches) and averaged 901 mm (33.5 inches; Figure 1b). The average weight of known age-3 female Chinook salmon at Strawberry Creek in 2016 was 18.98 pounds (N = 926), which was up from 13.1 pounds in 2015 (N = 329) and above the long term average of 16.5 pounds (Figure 2). Overall, weights of age-3 female Chinooks have been below average during 9 of the past 13 years from 2004-2016 (Figure 2). Lamprey scars were identified on the left side of each Chinook (i.e., as each fish laid left side up on a measuring board), and 58 Chinooks (2%) had lamprey scars, while 2,837 (98%) had no scars. Chinook fin clips were identified including 2,870 (99.1%) with adipose clips, 23 (0.8%) with no clips, and 2 (0.1%) with unknown or unidentified clips.



Strawberry Creek Salmon Spawning Facility: 2016 Summary

Fall 2016 Biological Data (continued):

A total of 2,513 coded wire tags (CWTs) were successfully recovered and read by the U.S. Fish and Wildlife Service. Most (89% or 2,225) of these Chinooks with CWTs were 2 or 3 years old from the 2014 and 2013 year classes (Table 2 and Figure 3). A total of 2,496 (99.3%) of the CWT Chinooks recovered at Strawberry Creek during fall 2016 were initially stocked at Strawberry Creek, while only 17 (0.7%) originated from other stocking locations including Algoma/Kewaunee (4 Chinooks), Green Bay (3), Gills Rock/Ellison Bay (3), and Lake Huron (7).

Figure 1. Length frequency distributions for male (a) and female (b) Chinook salmon processed for data at the Strawberry Creek Salmon Spawning Facility during October 3-20, 2016. Frequencies are expressed as numbers of fish per 10 mm length grouping.

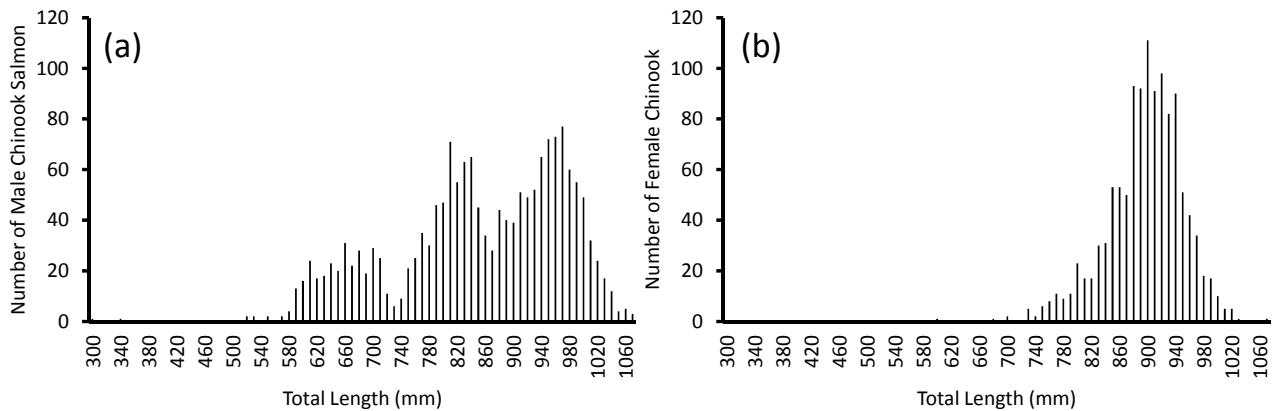
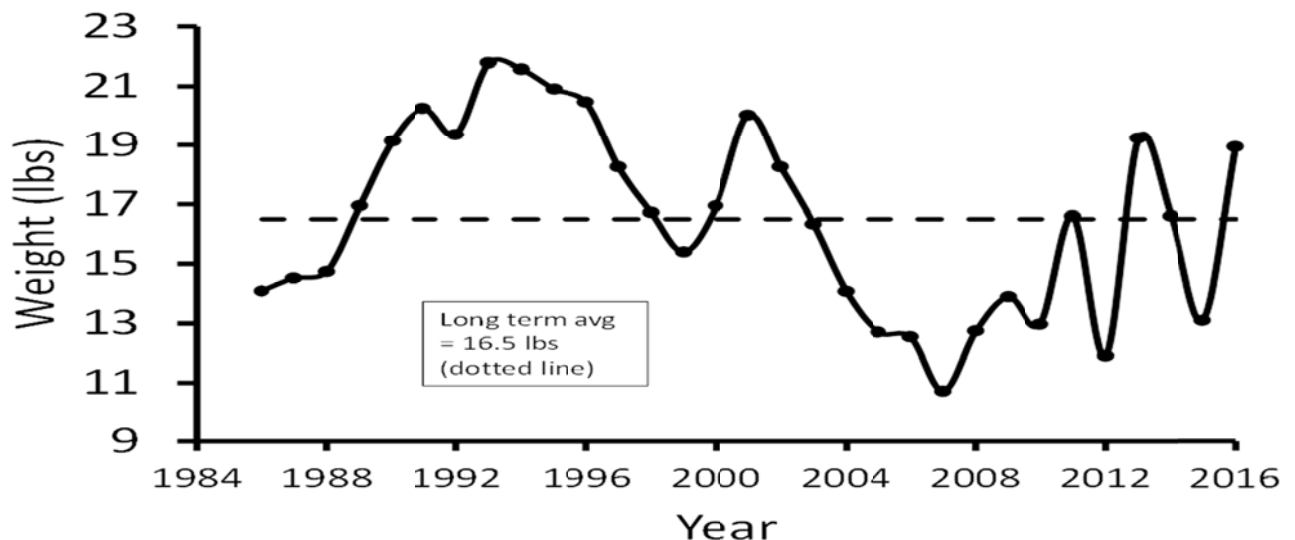


Figure 2. Average weights for age-3 female Chinook salmon collected at Strawberry Creek annually from 1986-2016. Recent ages were determined using coded wire tags (CWTs). Recently calculated average weights were 18.98 pounds for 2016 (N = 926) and 13.1 pounds for 2015 (N = 329). The long term average is 16.5 pounds.



Strawberry Creek Salmon Spawning Facility: 2016 Summary

Table 2 (left). Numbers of male and female Chinook salmon per age class based on coded wire taggs (CWTs) collected at Strawberry Creek during October 3-20, 2016.

Figure 3 (right). Percentages of male and female Chinook salmon per age class based on CWTs, also collected at Strawberry Creek during October 3-20, 2016. This figure was created with data from table 2 (left) and is just a visual depiction of this age composition data.

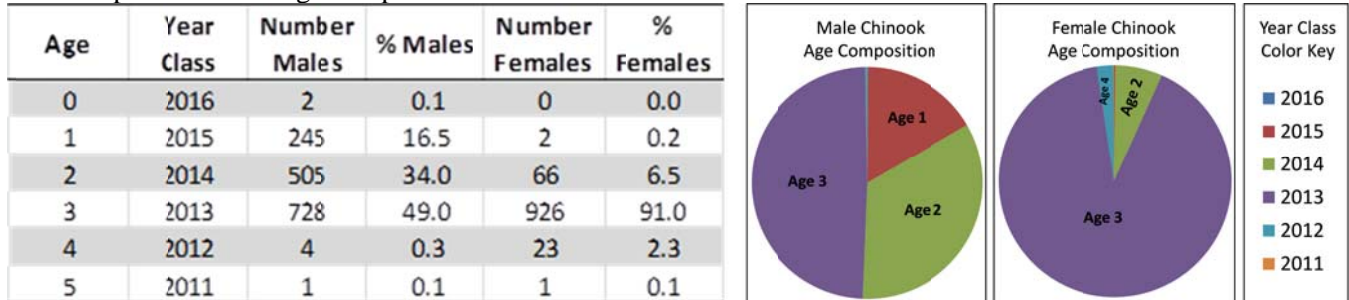


Figure 4. Numbers of spawning Chinook salmon handled at Strawberry Creek by year from 1981-2016. The return for 2016 (3,047) was below the long term average of 4,731 (for 1981-2016) but was above a recent low of 1,869 in 2015. Several factors impact these returns including: stream flow from rainfall and the pump, weather, water temperature, lake level, stocking numbers, survival rates, facility operation dates, etc.

