



YAKAMA NATION – YAKIMA KLICKITAT FISHERIES PROJECT

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**LOWER YAKIMA RIVER
SUPPLEMENTATION AND RESEARCH
PROJECT
ANNUAL REPORT**

July 1, 2014 to December 31, 2015

Contract # 56662 REL 63

Project # 1997-013-25

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Introduction

The Lower Yakima River Supplementation Complex (LYRSC) has been working to increase the coho and Fall Chinook salmon with use of local broodstock populations and acclimation of out of basin pre-smolts. Fish from Columbia River hatcheries are annually acclimated in strategic areas and local adult returns are trapped to use as broodstock. The long-term goal is to phase the out of basin transfers out in favor of the local stock once the populations and facilities will allow.

The Yakama Nation (YN) have used coho from lower Columbia River hatcheries to supplement Yakima River coho populations in order to further natural production and harvest goals identified in the Yakama Nation's Coho Salmon Species Plan for the Yakima River Basin" (CSSP). In addition, the YN will implement an experimental in-basin broodstock collection program to utilize natural returns of hatchery adults to improve the probability of success for the initial phase of coho restoration feasibility studies in the Yakima River basin.

Selected habitats and acclimation pond sites in the Yakima River basin have been identified for the potential reprogramming of adult and/or juvenile coho from appropriate lower river hatcheries. It is expected that when these fish return as adults they will spawn naturally in areas close to where they are released with the resulting production rearing in suitable production areas identified in the CSSP for about 17 months prior to outmigration. Similarly, juvenile releases would rear for up to one year in suitable production areas then return after ocean migration to these same areas to spawn. Pre-smolts would be acclimated for one month in low cost ponds previously identified or those utilized in studies from prior years. Marion Drain was constructed to return irrigation overflow and groundwater seepage to the Yakima River from agricultural lands located on the Yakama Reservation. It has large component of high quality groundwater influence along with irrigation overflow.

The Yakima River mainstem fall Chinook are located in the lower portion of the Yakima River. The majority of spawning occurs from Zillah to the river mouth. This stock has been supplemented with out-of-basin upriver bright stock for several years. John Day Mitigation upriver bright fall Chinook from Little White Salmon National Fish Hatchery have been planted annually each spring since 1983. Since 1994 the fall Chinook has been acclimated at the Prosser Hatchery site. The Prosser Tribal Hatchery allows the Yakama Nation to use locally adapted broodstock from the Yakima River. The Prosser Adult Trap at Prosser Dam and the Chandler Canal were utilized to collect broodstock from the Yakima River stock. The adults were transported to the Prosser Hatchery for holding and spawning, followed by incubation and early rearing.

Marion Drain/Yakima River experimental supplementation work was conducted by the YN in coordination with the Washington Department of Fish and Wildlife (WDFW) through the YKFP management framework. This Marion Drain/Yakima River supplementation scheme with a

strong monitoring/evaluation component should greatly enhance fall Chinook restoration in the Yakima basin.

A summer Chinook reintroduction program was also started. Green eggs are brought in from Wells Hatchery and spawned at Marion Drain Hatchery. These eggs are held in an egg-isolation unit at Marion Drain Hatchery. When these eggs are determined to be virus free these eggs are taken into the incubation room. When these eggs hatch the juveniles are reared at Marion Drain Hatchery until they are taken to an acclimation pond (Nelson Springs and Roza Dam) acclimated and released.

Fish Production

Fish Production at the Lower Yakima Rivers Supplementation & Research Facilities

Prosser and Marion Drain Hatcheries 7/1/2014 – 12/31/2015

Brood Stock	Number	Fish size at release or time of report fish/lb.	Rearing Release Strategy
2013 Yakama Coho	398,297	17-19	Spawned Reared and released from Prosser Hatchery
2013 Yakama Coho	208,359	17-19	Spawned and reared at Prosser Hatchery. Acclimated and released at acclimation sites.
2014 Yakama Coho	506,375	30-35	Spawned and being reared at Prosser Hatchery for 2016 release
2015 Yakama Coho	220,000	eggs	Spawned at Prosser Hatchery
2014 Yakama Chinook	587,123	95-125	Spawned reared and released from Prosser Hatchery
2015 Yakama Chinook	480,000	Eggs	Spawned at Prosser Hatchery
2014 Wells Summer Chinook	195,000	95-120	Green eggs from wells reared at Marion Drain released at acclimation sites.
2015 Wells Summer Chinook	180,000	eggs	Green eggs from Wells Hatchery incubated at Marion Drain

Coho

The coho production for the Yakima Basin consists of taking local brood from the Prosser Dam adult trap. The fish are held at Prosser Hatchery until ripe and spawned, incubated and reared the initial year on site. The yearling fish are then transported to one of the acclimation sites listed below for additional rearing and release. There was also a parr plant in mid-July. There

were 27,000 PIT tagged yearlings released in nine different tributaries. The following is a list of the coho production released as smolts:

Coho redd Counts 1998-2015

	Yakima River	Naches River	Tributaries	Total
1998	53	6	193	252
1999	104		62	166
2000	142	137	67	346
2001	27	95	25	147
2002	4	23	16	43
2003	32	56	55	143
2004	33	87	150	270
2005	57	72	153	282
2006	44	76	187	307
2007	63	87	195	345
2008	49	60	242	351
2009	229	281	485	995
2010	75	276	327	678
2011	82	243	196	521
2012	148	228	172	548
2013	45	69	67	181
2014	576	86	485	1,157
2015	13	0	59	72

Lower Yakima River Fall Chinook

The fall Chinook production for the Yakima Basin consists of taking local brood from the Yakima River either from the adult trap at Prosser Dam, the denil at Prosser Hatchery or capturing adults that fall back into Chandler Canal. The fish are held at Prosser Hatchery until ripe and then they are spawned. The eggs are incubated until hatched and then reared on site. The Chinook are reared under accelerated growth regimes by not chilling the well water in the incubation stage. This is done to increase the size in efforts to get the smolts out sooner, by being able to mark the larger fish sooner.

Yakima Basin Fall/Summer Chinook Redd Counts 2000-2015

	Yakima River	Naches River	Marion Drain	Total
2000	29*			29
2001	71*		35	106
2002	740		56	796
2003	2065	11	86	2162
2004	574	2	100	676
2005	352	0	56	408
2006	400	0	60	460
2007	329	0	67	396
2008	243	0	46	289
2009	288	0	70	358
2010	326	0	59	385
2011	393	1	59	453
2012	276	1	54	331
2013	485	61	74	620
2014	434	49	75	558
2015	1,282	16	160	1,458

*Redd count for below Prosser Dam only.

Blank entry is NO DATA AVAILABLE

Fish Culture

The wide array of multiple species and brood years reared at the Lower Yakima River facilities requires a wide range of fish culture activities during the year. Regular duties included: feeding fish, cleaning ponds and screens, monitoring water quality, monthly samples, brood stock collection, weekly examination for adult ripeness, spawning and egg incubation, fry ponding, facility maintenance and minor repairs to the hatchery.

Coho

The coho are part of the YKFP reintroduction study. Since acclimation of Lower Columbia River stocks increased the adult population in the Yakima Basin, local brood is now being evaluated to determine the effectiveness for future supplementation. Prosser Hatchery (PH) is used for the local broodstock program. The adults can be captured on either the right bank of Prosser Dam or the hatchery effluent denil trap. They are then held in one of the rearing ponds at PH. Eggs were incubated in chilled well water ranging from 38° – 57° F. This year fry were placed in the upper and lower raceways for initial feeding then transferred to the new raceways for tagging and rearing. Pre-smolts were then trucked to acclimation sites for final rearing and release. The coho acclimation ponds are described below.

Lost Creek Pond

Located in the Upper Naches River near Cliffdell, consists of two ponds adjacent to the Naches River. Prior to putting fish in the ponds, algae and other debris is removed. A seine net is pulled through the ponds and all debris hauled away from the site. The ponds are divided into two separate rearing areas by placing a screen in the ladder structure between the ponds.

There were ~100,210 Yakima Basin coho stock (reared at Prosser Hatchery) and trucked by YN delivered to Lost Cr. Pond for final acclimation.

Stiles Pond

Located near the town of Glead on private property about ½ mile from the Naches River. Prior to using the ponds the ditch needed to have weeds removed and minor cleaning of the ponds. The pond was excavated into two rearing ponds. Screens were placed at the head of the upper pond, between the two ponds and at an irrigation diversion.

Mitchell Act coho from Eagle Creek National Fish Hatchery (ECNFH) are trucked to Stiles Pond by the Washington Department of Fish and Wildlife (WDFW) and Prosser Hatchery coho are trucked by YN. Approximately 103,375 Eagle Creek Coho Stock (reared at Eagle Cr.) and 108,570 coded wire tagged Yakima Basin stock (reared at Prosser) were transferred to Stiles Pond. There were 2,500 PIT tagged coho in each stock to compare survival.

Boone Pond

The site was selected for coho supplementation work because of its location in the watershed, proximity to the main stem Yakima River and large source of cool, clean water. The existing large pond gives us the rare opportunity to control flows and monitor out-migration of coho smolts at existing structures. The location is in an area that is suitable to accommodate high numbers of spawning adult coho salmon. In addition to the ponds benefits for coho production, the property also hosts outstanding habitat features. The pond had restoration done to it 6 year ago. Dozens of logs and stumps were placed into the pond, many willows and pine trees were also planted. The land owners are very large supporters of the Yakama Nation and its Fisheries

Program. The Boone property offers the coho program an excellent chance at successful coho acclimation and future coho recovery in the upper Yakima River.

There were no fish transferred to Boone Pond in 2012, 2013, 2014 or 2015.

Holmes Pond

Located near Ellensburg, the site was selected for coho supplementation work because of its location in the watershed, proximity to the main stem Yakima River and large source of cool, clean water. The existing ponds give us the rare opportunity to control flows and monitor out-migration of coho smolts at existing structures. The location is in an area that is suitable to accommodate high numbers of spawning adult coho salmon. In addition to the properties benefits for coho production, the property also host outstanding habitat features. A side channel of the Yakima flows through 2,400' of the property, entering the river only 400; below the downstream property boundary. Wetlands and riparian habitat are also featured. The property also includes a large, senior water right that could be placed in the Yakima Basin Water Trust. At present the water is used for irrigation to support livestock grazing. The instantaneous water right, now adjudicated and in trust, is 3.31 cubic feet per second.

The Holmes property offers the coho program an excellent chance at successful coho acclimation and future coho recovery in the upper Yakima River.

Mitchell Act funded coho from ECNFH were trucked to Holmes Pond by WDFW trucks. There were 143,770 Adipose Clipped coho transferred. There were 2,500 PIT tagged coho in this transfer. A volitional release was used, with the screens pulled on April 15.

Easton Department of Transportation Ponds

Old gravel pits used by D.O.T. which are near the town of Easton and adjacent to the Yakima River make up the uppermost acclimation site on the Yakima River. The water source is the Yakima River which flows through the ponds with additional seepage and reenters the river through an outlet channel.

Funded by Mitchell Act - Coho from ECNFH were delivered to the Easton Ponds, by WDFW trucks. There were 236,749 adipose clipped Eagle Creek coho transferred. The screens were pulled on April 15 for a volitional release. There were 2,500 PIT tagged fish in this group.

Mobile Acclimation

Mobile acclimation sites are currently located on South Fork Cowiche Creek and Rattlesnake Creek. Each vessel is 20 ft. long, 4 ft. deep and 5 ft. wide. They typically cycle 60-90 gallons of water per minute (gpm). The Cowiche site is operated off electricity with a backup generator. The Rattlesnake site is operated of a 17 KW generator and 1,000 gallon propane tank. The Cowiche site holds 20,000 smolts, where the Rattlesnake site holds a maximum of 10,000 coho smolts.

Coho from Prosser Hatchery were delivered to Cowiche Cr. on March 13th. Standard fish culture practices were observed, with at least two visits daily. These fish were released on April 16th. There were no coho acclimated at the Rattlesnake Creek site in 2014, due to ice conditions.

Parr Releases

Parr are released in late summer to assess over winter survival in 9 select tributaries. The parr are PIT tagged in mid-July and scatter planted in early August. Each tributary receives approximately 3,000 PIT tagged coho. Coho parr range from 79-90 mm in length. The fish then must over winter and migrate out the following spring.

Tributaries include, Big Creek, Reecer Creek, Wilson Creek, Hundley Pond, North Fork Little Naches, Little Naches, Nile Creek, Little Rattlesnake Creek and South Fork Cowiche Creek on the Naches River.

Prosser Tribal Hatchery

Coho Smolt Releases

In addition to mainstem acclimation and tributary releases coho are being released on station at the Prosser Tribal Hatchery. These releases were implemented to ensure that the coho brood is of Yakima River origin. Fish collected off the dam could be wild and or from Eagle Creek National Fish Hatchery. In 2015, approximately 340,000 coho smolts were released on April 15. In 2013, approximately, 322,000 smolts were released. This is giving up a plentiful broodstock supply and fish to outplant into tributaries.

Fall Chinook

Prosser Tribal Hatchery

The Prosser Tribal Hatchery was originally designed as a fall Chinook acclimation facility. It was constructed in 1994 using Mitchell Act funds. A site near the Chandler Fish Screen downstream of Prosser Dam was chosen as the acclimation site. The facility is located in S2, T2N and R24E, north of Prosser on the north bank of the Yakima River. Subsequent improvements expanded the facility's capabilities beyond acclimation to include those of a full hatchery which incorporated adult holding, egg incubation and rearing components. The facility uses surplus Yakima River water made available for operation of the Chandler Juvenile Facility. The water is diverted from the Chandler Canal to the juvenile facility. Surplus water is screened and diverted to the hatchery by gravity flow. During BOR canal maintenance the surface water is pumped to the head of the hatchery via an electric submersible pump. The fish are reared in large, low-density lined ponds and raceways. They are released through an open channel directly into the Yakima River. The outlet structures have screens to prevent premature fish release, dam boards to control the pond water level and are constructed so that the ponds can be completely drained. The Yakima River fall Chinook broodstock were collected from Chandler Canal. The canal was shut down for one day on October 21 to allow Yakama Nation staff the opportunity to remove salmon trapped in the canal. Excess fish are returned to the river but some are held at

Prosser Hatchery for broodstock. Additional broodstock are collected at the right bank steep pass trap at Prosser Dam and the steep pass trap in Prosser Hatchery effluent channel. Results of prior released indicated the accelerated growth produced higher adult return rates. The fall Chinook were volitionally released at strategic times directly from the PH facility. All fall Chinook, in and out of basin were acclimated and released from Prosser Hatchery Ponds. All summer Chinook were acclimated and released from Nelson Springs and Roza Dam acclimation raceways.

Marion Drain Hatchery

Marion Drain Hatchery has two large lined ponds, six raceways, an incubation room, an egg isolation trailer, water chiller, two pole buildings (used to hold fish hauling trucks, sensitive equipment, pumps, generators) a mechanical building, caretaker's house and the YKFP maintenance shop. Green eggs from Wells Hatchery summer Chinook were spawned at MDH and then were incubated and reared at Marion Drain Hatchery. The fish were trucked to Nelson Springs and Roza Dam acclimation raceways, for final acclimation and release

Fish Health

Pathologist from the U.S. Fish and Wildlife Service are under contract to monitor the fish health. They travel from the Lower Columbia River Fish Health Center at the Columbia River monthly to examine fish at all sites. They also take samples from the broodstock during spawning and do pre-release exams.

The following is the yearly fish health report submitted by Lower Columbia River Fish Health Center:



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Lower Columbia River Fish Health Center

201 Oklahoma Road

Willard, Washington 98605

FISH HEALTH SUMMARY

For

Lower Yakama River Supplementation and Research Program

July 1, 2014 to December 31, 2015

Coho Salmon

Prosser Coho Stock, Broodyear (BY) 2013 at Prosser Hatchery

July 2, 2014, the BY 13 coho fry were free of parasites and negative for reportable bacteria, just ahead of the marking about to begin. A similar report was obtained in September.

In November, Pond 3 lost river water completely, resulting in the death of 2-4K dish had died over the Thanksgiving weekend—Fish Health staff was not notified. By the December 3rd health exam, there were still about 1000 mortalities which were being cleaned from the bottom of the pond. The rest of the fish looked good and there were no findings of bacteria. The finding of pollen/mold spores in the gills did not result in lesions or pathology. Pollens/mold spores were still seen in the gills in the Jan. 7, 2015 exam of 10 fingerlings—maybe only a sign of a strange warm season. At the first pre-release exam, Jan. 22nd, the fish were healthy with clean gills and skins, no virus (0+/60) and no bacteria (0+/30 by TYES, TSA, and DFAT). A portion of this brood-lot was scheduled for a potential outplant to a mobile acclimation site at the end of February. A volitional release of the rest of the BY13 coho smolts from

Prosser Hatchery began shortly after the second pre-release exam of 60 fish, Feb. 23rd--again all healthy, clean fish.

Eagle Creek coho stock¹, BY13, at Eagle Creek National Fish Hatchery

In mid- June 2014, the monthly mortality due to coldwater disease was 2.7%, with 15-27 dead fish/day in all raceways. A decision to treat with florfenicol feed was made; however, there was a delay in delivery until July 8th when the feed company sent the wrong size. At this point the decision was to forget about the medicated feed as the warming water temperatures appeared to be reducing the infection. By August, the mortality had declined significantly. In early September, the mortality was low, with a few fish showing signs of a chronic infection. Similar to last year, the fish were stressed from bird predators despite continued efforts of deterrence with the use of raceway netting and/or covers. After tagging in December 2015, mechanical injuries were responsible for a minor mortality; however, fish remained healthy with no detections of bacteria in the December, January and monthly samplings (0+/10 on TYES, TSA). No reportable bacteria or virus was found in the pre-release exam of 60 fish on Feb. 11, 2015 and in a March exam, 3/31/2015, ~98% had no coldwater disease and all had plenty of fat reserves in preparation for their upcoming March transfer to Yakima River acclimation sites and an April 2015 release.

Prosser Coho Stock, BY 2014 at Prosser Hatchery

The coho adults (150 females, 60 males) were sampled on November 4th and 12th, 2014. No virus was detected in individual sampling of the adults, nor reportable bacteria (0+/30 on TSA). *Ceratonova shasta* was detected in low to high numbers in the guts of 13 of 20 fish sampled. In addition, all 30 females from the first spawn had apparent clinical infestations of this parasite in other internal organs. The enzyme-linked immune-sorbent assay (ELISA) showed no to very low levels of *Renibacterium salmoninum* in 99.5% of the adults. Only one female had a moderate level.

On April 13, 2015, the BY14 coho progeny were on well water, 56 F, at 400 gpm. Elevated mortality was occurring, possibly from coldwater disease, although the causative bacterium was not detected in the kidneys of the 10 fish examined. The fish bellies were bloated with feed and the gastrointestinal fungus *Phoma* was noted. The recommendation was made to split the fry to lower densities and increase the flow to prevent an onslaught of coldwater disease and to clean the raceways. A couple weeks later, April 21st, no bacteria (0+/12 on TYES/TSA) or virus (0+/60) were detected. The week of June 22nd, some of the BY14 coho fry were to be out-planted. The monthly exam on the 22nd revealed healthy fry with no gill or skin parasites. Sixty of these fish were taken for a pre-release exam;

¹ If feasible, up to 550 K Prosser coho eggs are reared at Eagle Creek NFH and returned to the Yakima Basin for this Mitchell Act Program. However, in 2013, Prosser coho adult egg contributions were low so the founding coho stock of Eagle Creek was substituted.

all were negative for virus (0+/60) and bacteria (0+/30 on TYES/TSA). Fish continued healthy through summer and fall, with no findings of bacteria or parasites. On August 19th, signs of gas bubble trauma were beginning—one well lacked stripping rings, a situation which was being corrected.

Prosser Coho Stock, BY2014, at Eagle Creek National Fish Hatchery

In late January 2015, ~550K Yakama Nation-Prosser stock arrived at Eagle Creek NFH as eyed eggs for the Mitchell Act program. There were a fair number of dead white embryos with red yolks. The Yakama Nation hatchery manager says that this condition occurs in the progeny from the early-arriving coho female adults which experience warmer Yakima River water conditions in the fall. During incubation at Eagle Creek, continuing mortality (30,212) occurred between hatch and ponding (March 27th), either through failure to hatch or to thrive after hatching. At the ponding exam on March 31st, the fish were healthy but smaller than normal (about 1 month behind the Eagle Creek and Nez Perce BY14 coho stocks). No virus (0+/60) or bacteria (0+/8 on TYES) were detected. On May 1st, the fish continued healthy, with no signs or detections of the bacterial coldwater disease that had made its appearance in the other stocks of coho. However, the disease did catch up to the Prosser stock by June 12th when a diagnostic exam revealed *Flavobacterium psychrophilum*. Water temperatures at EC NFH had been at 55-65 F for the past week and mortality was high enough to consider treatment with florfenicol feed. However, salt treatments to alleviate stress and an increase in water flow to those raceways caused the mortality to subside to normal levels by about June 20th. Ouzels still remain a problem at the hatchery and are a cause of minor mortality. By July, mortality had ceased due to coldwater disease and in an exam of ten fish, the causative agent, *F. psychrophilum*, was not detected in either the brain or kidneys. Through August and September, mortalities remained low and the exam of 10-11 fish in monthly exams in September and November revealed no evidence of *F. psychrophilum* or any other pathogen. Fish looked good, with clean gills and skin in both exams.

Prosser Coho Stock, BY 2015 at Prosser Hatchery

The coho adults (150 females, 60 males) were sampled on Nov. 3rd, 10th, 17th, 2015. No virus was detected in individual sampling. The agent of furunculosis, *Aeromonas salmonicida*, was detected in 20% (6+/30 samples). *Ceratomyxa shasta* was at clinical levels in the guts of the first take adults (10+/10), and for all of the takes, this parasite was found in 16+/20 adults sampled. Across the Columbia River basin, many of the salmonid stocks had high clinical infestations of *C. shasta* which was responsible for pre-spawn mortality.

Eagle Creek Coho Stock, BY 2015 at Eagle Creek NFH

The coho adults (198 females, 60 males) were sampled on Nov. 4th, 10th, and 18th in 2015. No virus was detected in the three fish pools. By ELISA, 99.5% of the 210 adults sampled rated at non-detected to very low (<0.099 OD). One female had very high levels. The parasite *C. shasta* was seen in

11 of the 20 guts examined. This year, the adults were smaller than normal and externally marred by fungus and other epidermal lesions. The run numbers were low and fecundity was lower than average.

Upriver Bright Fall Chinook Salmon

Prosser Stock, URB Chinook, BY 2014, Prosser Hatchery

The adults (150 females and 60 males) were sampled on Oct.29th and Nov. 4th, 2014. There were no detections of virus (0+/150, 0+/60), reportable bacteria (0+/30) or *Ceratonova shasta* (0+/20). For all but one female, the levels of *R. salmoninarum* were non-detected to very low by ELISA (less than 0.199 O.D. in 149 females, 60 males). The one female had very high level of *R. salmoninarum* (>1.0 OD) and preferably, her eggs should have been culled.

The ponding health exam of 60 fry occurred on March 23rd, 2015. Early drop-out issues were still occurring with ~10% of the fry not completely buttoned-up, although there was no evidence of *Phoma* (which happens with premature feeding) and no virus (0+/60), and no reportable bacteria (0+/30). By April 13th, the fish were on mixed water (well and canal) at 52 F, 500 gpm, and still healthy with no bacterial or parasite detections. Health notes remarked that cleaning of the raceways were in order. By the time of the 60 fish pre-release exam, April 21, 2015, fish were healthy with no detections of virus (0+/60), bacteria (by TSA/TYES culture, DFAT) or parasites (0+/10 on gills and skin).

Priest Rapids Stock, URB Chinook, BY 2014, Prosser Hatchery

On their first exam at Prosser, April 13, 2015, the water supply was mixed canal/well water at 52 F, 500 gpm, same as for the Prosser BY14 URBs; however, elevated mortality was occurring from amoebic gill disease, and possibly, bacterial gill disease. Higher numbers (3-10/gill arch) of amoeba were noted on the dead fish, compared to the gills (1-2 amoeba/gill arch) on healthy-appearing fish. No bacteria were noted in the kidneys of these 10 fish. In the guts, *Phoma* and *Hexamita* were noted at 3-200 parasites/field. Some *Ichthyophtherius* and fungus on the skin were also in the pathogen line-up, firing the warning sign that the raceways needed cleaned. As of April 14th, the mortality had reduced and the staff was working on removing the old mortality and cleaning the raceways. By the time of the 60 fish pre-release exam, April 21st, fish were healthy with no detections of virus (0+/60), bacteria (0+/30 by TSA/TYES culture and DFAT) or parasites (0+/10 on gills and skin).

Little White Salmon Upriver Bright Chinook, BY14

The brood adults spawned on Oct. 28th and Nov. 3rd, 2014, at Little White Salmon National Fish Hatchery (LWS NFH), had a 47% prevalence of IHNV (33+/70 three fish pools). Over 99% of the adults had no to very low levels of *R. salmoninarum* (less than 0.099 OD by ELISA). No other reportable bacteria were detected (0+/30), nor was *C. shasta* found in the intestines (0/20). Their progeny were tested on March 10th, 2015 and found free of virus (0+/60). In April 2015, ~1.7 M juveniles were transferred from LWS NFH to the three big acclimation ponds at Prosser Hatchery. During their stay, the fish experienced good water conditions in the ponds and were released with no health issues in May.

Yakima Stock, URB Chinook, BY 2015, Prosser Hatchery

The adults (98 females and 60 males) were sampled on Oct.28th, Nov. 3rd and 10th in 2015. There were no detections of virus (0+/210 females/males), reportable bacteria (0+/30 on TSA) or *Ceratomyxa shasta* (0+/20).

Little White Salmon Upriver Bright Chinook, BY15

The brood adults spawned on Oct. 19th, 27th and Nov. 9th, 2015, at the LWS NFH, had a 26% prevalence of IHNV (18+/70 three fish pools). All of the adults (150 females, 60 males) had no to very low levels of *R. salmoninarum* (less than 0.099 OD by ELISA). No other reportable bacteria were detected (0+/30), nor was *C. shasta* found in the intestines (0/20).

Summer Chinook Salmon

Wells Hatchery Stock, Summer Chinook, BY 2014

Summer Chinook eggs from two takes of BY14 adults at Wells Hatchery were taken for rearing at Marion Drain. On Oct. 15, 2014, 15 samples (ovarian fluid, kidney) were taken from 15 females by the Wells hatchery staff and frozen. The green eggs from these females were sent with milt to be fertilized 1:1 at Marion Drain; these eggs were submitted to accelerated incubation at 50°F until hatch. Eggs from another 60 females and milt from 60 males were collected on Oct. 22nd and shipped to Marion Drain for 1:1 fertilization and incubated normally at 45°F until hatch. From these females, 60 samples were collected by the LCRFHC, and all samples (60 fresh and 15 frozen) transported to the FHC for analysis. The eggs from all females were identified according to the female's fish health number and kept in isolation (isolated from other stocks; effluent contained to prevent contamination) on chilled well water until fish health results for virus and *R. salmoninarum* were completed. No virus was detected after 4 weeks on cell culture and the ELISA results revealed 98.37% no-low risk of vertical transmission of *R. salmoninarum* and 1 fish with Very High titer (≥ 1.00). Eggs/sac fry from the very high titer female were

culled. At eye-up, the eggs were transferred from the isolation unit to Heath trays, with the same temperature regimes (50 and 45°F), at Marion Drain.

On Feb.23, 2015, a ponding exam of 60 BY14 progeny from the Oct.15 take showed the lot negative for virus. From a 10 fish subsample, all were negative for bacteria (on TSA, TYES) and negative for *R. salmoninarum* by DFAT. Incubation at 50 F had advanced their growth and these fry were sent to the Roza acclimation site within the week. The second take of BY14 fry, incubated at 45 F, were sampled on March 9th, with no findings of virus (0+/60) or bacteria; however, some 300 mortalities/unit had been occurring and saddleback lesions (5+/10), some fungus (1+/10), and *Phoma* were noted in the fry, half-not buttoned up. Of interest was the finding of guanine-like crystals in the kidney which initiated further investigation using histology. Nine whole fry were examined with no findings of abnormal pathology in the kidney or other tissues. There was also no food in in the gastrointestinal tracts. It was suspected that feed transition problems, and, perhaps fish meal quality, were to blame. By March 10, mortalities were at ~ 20 fish per day and shortly thereafter, the issue resolved itself. This problem and the peculiar crystals occurred in the mortalities of two other stocks of fry at two other hatcheries. For all cases, the crystals did not appear in the histological preparations (likely due to being solubilized by the fixation reagents), nor was there kidney damage. All of these cases were documented by the FWS nutritionist at the Abernathy Fish Technical Ctr. The BY14 summer Chinook followed through their fry-hood on a good note, and at the April 21st pre-release exam, they were healthy with no virus (0+/60) or reportable bacteria (0/30 on TSA/TYES and DFAT).

Wells Hatchery Stock, Summer Chinook, BY 2015

Samples collected from 85 female adults, spawned on Nov. 21, 2015 at Wells Hatchery, were negative for virus (0+/85). One female, partially green, was spawned. Overall, the fish were big and healthy. Green eggs and milt were taken to Marion Drain for fertilization and rearing.

S. Gutenberger, April 10, 2016

*Reportable fish pathogens (disease): *Aeromonas salmonicida* (furunculosis); *Renibacterium salmoninarum* (Bacterial Kidney Disease or BKD); *Yersinia ruckeri* (Enteric Redmouth Disease); Infectious Hemorrhagic Necrosis Virus (IHNV); Infectious Pancreatic Necrosis Virus (IPN); Infectious Salmonid Anemia Virus (ISA); Viral Hemorrhagic Septicemia Virus (VHSV); *Myxobolus cerebralis* (Whirling Disease).

DFAT: Direct fluorescent antibody test (for *R. salmoninarum*). TYES: Tryptone yeast extract plus salts (for detection of Flavobacteria, like *F. psychrophilum*, agent of coldwater disease). TSA: Tryptic soy agar (for culture of gram negative bacteria, including *A. salmonicida*).

All tests and assays are done in accordance with the AFS-USFWS Blue Book standards.

Vehicle Maintenance

Ten GSA vehicles were leased for this project. Two vehicles were used by the tribal biologists for site visits and traveling to meetings. Three other vehicles were assigned to the Maintenance Technicians to transport tools and supplies to work sites. Four vehicles were used by the Fish Culturist for two hatcheries and various acclimation ponds. One large flatbed used to haul the fish transporting tank. Regular oil changes and maintenance was performed under the GSA contract.

Maintenance

Three full time Maintenance Technicians (time split within YKFP - 1 dedicated mainly to Prosser Hatchery) take care of the repairs, maintenance, and fabrication needed for the YKFP programs. The facilities that they maintain are: Prosser Hatchery, Marion Drain Hatchery, all fall Chinook and coho acclimation sites, Cle Elum Spring Chinook Hatchery, Spring Chinook acclimation sites (Easton, Jack Creek and Clark Flats). They also work with the following M&E Biologists, where they repair, do regular maintenance and/or fabricate items as needed: Coho M&E, Fall Chinook M&E, and Spring Chinook M&E, and Klickitat M&E Biologists, and the Habitat Biologists. The YKFP Maintenance Shop is located at Marion Drain Hatchery.

Training

Training for the Fish Culturists and Maintenance Technicians this year has been mainly on the job training. The following shows the training that personnel were sent to: the lead Bookkeeper attended National Seminars in April 2015 and OMB Circulars training in December 2015; two Fish Culturists added the Northwest Fish Culture Conference in Portland. in December of 2015.

Meetings and Tours

Regular meetings for the staff include the monthly policy group and bi-monthly fishery staff meetings. The staff also meets with members of STAC to update and coordinate fish rearing objectives. The Benton Conservation District, the Yakima Conservation Corps, and the Yakama Nation Headstarts schedule tours for schools to visit the Prosser Hatchery to get an understanding of what is being done in the Yakima River for salmon enhancement. Following is a list of the tours this past year:

2015 Tours

3/29/15 – Family of 3; 4/27/15 – Yakama Nation Headstart – Wapato, 16 students; 4/28/15 – Yakama Nation Headstart – Toppenish and Wapato, 48 students; 4/29/15 – Mt. Hood Community College – 20 students; 4/29/15 – Yakama Nation Headstart – Wapato and White Swan, 48 students; 4/30/15 – Wapato, Toppenish, and White Swan, 47 students; 5/1/15 – Wapato Middle School, 30 students; 5/7/15 - Sunnyside Christian fourth grade and tenth grade, 40 students; 5/8/15 – Garfield Elementary – 60 students from the fourth grade; 5/9/15 – family of 8; 5/14/15 – Pioneer Elementary – 150 fifth grade students; 5/15/15 – Zillah Intermediate 30

fourth grade students; 5/17/15 – family of 11 from Prosser; 5/27/15 – Chief Kamiakin – 180 6th grade students; 5/28/15 – Toppenish Middle School – 200 7th, 8th grade students; 6/8/15 – family of 4 from Sunnyside; 7/28/15 Prosser Leadership FFA – 37 students; Prosser Elementary – 60 5th grade students.

Personnel

The project employees: two full time Fish Biologists; two Administrative Personnel; one Fish Culturist V (Lead Foreman), five Fish Culturist II's; three Fish Culturist II (split between LYRSRC, the Tribal account, and the Steelhead Kelt Reconditioning Contract); two seasonal/temporary Fish Culturist II and three Maintenance Technicians (split within the YKFP program). Since there is no housing on station at Prosser, the facility has personnel on duty 24 hours every day. Two full time Fish Culturist II are night shift and one is scheduled swing shift. Marion Drain has one house on station where a Maintenance Technician resides as the caretaker for the Hatchery and YKFP maintenance shop.

Annual DOE Report

The following letter to DOE serves as the report for January 1 – December 31, 2015.

Yakama Nation Fisheries Department

15 West Yakima Ave.
Suite200
Yakima, WA. 98902

RE: Annual Summary of Chemical Usage for 2015

To whom it may concern

The Yakama Nation Prosser Hatchery is required to submit an annual summary of all chemicals used at the fish rearing facility. Chemicals are required at times to ensure safe rearing conditions for the fish. Any chemical used at the fish rearing facility is produced for the specific use and an accepted method in fish culture. Four chemicals used the past year include; Tricane Methanesulfonate (MS222), Argentine (Iodine solution), Hydrogen Peroxide and Paracide F (Formaline solution).

The MS-222 is used for fish culture to anesthetize the fish for easy handling and reduce stress. The chemical is used when fish must be handled for adult broodstock or juvenile monitoring at a rate of 20-mg. /liter. A total of 1500 grams of this chemical was used in 2015. The MS-222 is diluted with water in closed container such as a storage box or fish tote and discarded into the ground after every use.

The Iodine solution is used to disinfect equipment to prevent spread of disease. The iodine solution is used to rinse any tool or outer wear that comes in contact with the hatchery water source. The iodine is also mixed to a solution of 1 part to 100 parts water and salmon eggs are disinfected. Argent chemicals inc. supplies the solution with a brand name Argentyne. Also Western Chemicals produces a similar product with the brand name Wescodine. A total of 23 gallons was used over the year. The iodine solution is rinsed off prior to use and unused iodine is discarded in the gravel parking area. The eggs are placed in a bath for ten minutes and the excess solution is poured on the floor and diluted.

Hydrogen Peroxide was prescribed to the fall Chinook salmon yearling to help with an external parasite infected the rearing area. A bath with 250 parts per million was administered for one hour on four occasions to help fight the infection. A total of 300 gallons were used for the year.

The Parricide F is 37% formaldehyde solution used to treat eggs and fish from external parasites. The formaline is dripped in the eggs at a rate of 1 part per 600 parts of inflowing water for 15 minutes five days each week during egg incubation period. It is dripped in tanks holding adult coho salmon at a rate of 1part per 6000 parts of inflowing water for one hour five days per week during adult holding period. A total of 50 gallons were used the past year.

The chemicals used were purchased through Argent Chemical Lab in Redmond WA and western Chemicals. The Products are manufactured specifically for these purposes. Feel free to contact me with any questions (509) 945-5899.

Feel free to contact me with any concerns or questions. Thank you.

Joe Blodgett
Yakama Nation Fish Biologist

New Additions or Modifications to Prosser & Marion Drain Hatcheries

- New chilling unit installed at Prosser Hatchery – 100 ton unit that will deliver required amount of chilled water and does not leak.
- Improved adult holding circular at the swim-in circular at the Prosser Hatchery denil trap by – placing boulders around and under it for improved stability; put up jump fence so fish cannot jump out of trap; and a cover to keep the fish calmer.
- Purchased a new trailer for transporting adults at Prosser Hatchery. Added a tote with air blower and air stones.
- Improved adult holding raceway – put privacy slats in fence to keep fish calmer.
- Installed several new lawn areas – removed weeds and rocks, leveled ground, brought in fill dirt, and laid sod –for esthetic value and also for dust abatement.
- Improved river pump station – installed tee to hook-up diesel pump for emergency use; raised the electric pump (river pump) with ecology blocks to protect from floodwaters.
- Repaired (one) and built (two) new pond feeding scaffolds.
- Repaired some and replaced raceway liners and pond liners (tears and Fish Health recommendations – creases can harbor pathogens).
- Installed deck, covered deck, and installed access door to the alarm central room in the pole building.
- Installed flow meters on all wells (3).
- Purchased a new ATV for transporting materials, feed, and fish throughout the hatchery.