



YAKAMA NATION – YAKIMA KLICKITAT FISHERIES PROJECT

P.O. Box 151 TOPPENISH, WA 98948 509-865-5121 FAX: 509-865-6293

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

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Prepared by Yakama Nation

Bill Fiander, YKFP Biologist

Joe Blodgett, YKFP Biologist

Yakima/Klickitat Fisheries Project

Melvin Sampson, Policy Advisor/Project Coordinator

Andre L'Heureux, BPA COTR

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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

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

Brood Stock	Stage to Hatchery	Number	# fish/lb. April	Rearing Strategy	Comments
2012 Yakima	Spawned at Hatchery	185,615	15 - 17	Spawned and reared at Prosser Hatchery moved to acclimation sites and released	5,00 PIT tagged fish released from these two sites –Stiles and Lost Cr. acclimation sites.
12 Eagle Creek NFH	Pre smolt		14-17	Trucked from hatchery to acclimation sites	100% CWT released from Stiles, Holmes, and Easton sites (Paid for by Mitchell Act)
2012 Yakima	Spawned at Hatchery	221,493	14-16	Spawned and reared at Prosser Hatchery	Released from Prosser (2,500 PIT tagged).
2013 Yakima	Spawned at Hatchery	685,908	12 - 18	Spawned and reared at Prosser Hatchery moved to acclimation sites and released summer of 2014	Released in 9 tributaries as Parr (all are PIT tagged). Released in summer of 2013.

Coho redd Counts 1998-2013

	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

Lower Yakima River Fall Chinook

Yakima Fall/Summer Chinook

Brood Stock	Stage to hatchery	Number	# fish/lb. April	Rearing Strategy	Comments
2012 Yakima fall Chinook	Green eggs	49598	12-15	Spawned and reared at Prosser Hatchery	100% PIT tagged released as yearlings
2013 Yakima fall Chinook	Green eggs	445565	90	Spawned and reared at Prosser Hatchery	Spawned, reared, and released from Prosser Hatchery
2013 Yakima fall Chinook	Green eggs	0	0	Spawned and reared at Prosser Hatchery	To be released as yearlings in 2014

Brood Stock	Stage to hatchery	Number	# fish/lb. April	Rearing Strategy	Comments
2013 Preist Rapids Fall chinook	fry	185,000	95		
2013 Little White Salmon NFH fall Chinook	Smolts	1542698	12-17	Reared at Little White Salmon NFH , trucked to Prosser by LWS & YN (paid for by Mitchell Act).	Acclimated, and released from PH. Marked by USFWS (paid for by Mitchell Act funds)

Marion Drain Summer Chinook

Brood Stock	Stage to hatchery	Number	Rearing Strategy	Comments
2013 Wells Hatchery Summer Chinook	Green eggs	286778	Hatched and reared at Marion Drain, tagged, divided into three groups. Two groups moved to Nelson Sp. and one group moved to Roza Dam for acclimation & release.	@ Nelson - 25,116 PIT plus CWT and 63,092 CWT only and at Roza - 15,087 PIT plus CWT and 33,268 CWT only.

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

	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

***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 ~94,680 Eagle Creek stock coho delivered to Lost Cr. from ECNFH. These pre-smolts were delivered by WDFW personnel.

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 92,376 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 or 2014.

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 offeres the coho program an excellent chance at successful coho acclimation and future coho recovery in the upper Yakima River.

Mitchell Act coho from ECNFH were trucked to Holmes Pond by WDFW trucks. There were 92,105 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 10.

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.

Coho from ECNFH were delivered to the Easton Ponds, by WDFW trucks. There were 213,092 adipose clipped Eagle Creek coho transferred. The screens were pulled on April 11 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 as 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 2014, approximately 221,567 coho smolts were released on April 15. In 2013, approximately, 322,000 smolts were released that survived at nearly 75% to McNary Dam. 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 releases indicated the accelerated growth produced higher adult return rates. The fall Chinook were voluntarily 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, 2013 to June 30, 2014

Coho Salmon

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

The coho adults (150 females, 60 males) were sampled on October 30th, Nov. 6th and 13th, 2013. No virus was detected in sampling of the adults (0+/20 x 3 fish pools, males; and 0+/50 x 3 fish pools, females). The agent of furunculosis, *Aeromonas salmonicida*, was detected in 23% (7+/30 samples). *Ceratonova shasta* was detected in 12+/20 fish. The enzyme-linked immune-sorbent assay (ELISA) detected no to low levels of *Renibacterium salmoninum* (<0.199 O.D.) in 99% of the adults. One female had medium levels.

On March 14, 2014, the BY13 fry rearing at Prosser Hatchery showed no signs of virus (0+/60) after ponding. The fish looked heavily stocked, but weren't stressed yet, so it was recommended that the fry be split into the raceways the next week. At the next exam, May 2nd, the fish continued healthy (~200K/raceway) with no findings of bacteria or parasites. Before the flows got too low, it was recommended that the fish be split, an item that was on the hatchery's list after the BY13 URB fry were completely released. This would then allow enough well water for the coho fry. No gill amoeba were

seen but staff need to watch for Amoebic Gill Disease when the fish get handled. For the coho fry leaving the hatchery for mobile acclimation raceways in the Yakima Basin, a pre-release exam was done on June 5th. No virus (0+/12 x 5 fish pools by cell culture), bacteria (0+/30 TSA) or parasites (on skin/gills) were detected.

Yakima Coho Stock, BY 2012, at Prosser Hatchery

On July 2, 2013, a re-release inspection of 60 fry showed no virus (0+/20 x 3 fish pools on cell culture), no bacteria by TSA/TYES (0+/30) or DFAT (0+/30), and clean skin and gills. It is presumed that some of this cohort was moved to an acclimation site(s) in the Yakima Basin. A quick observation on July 15th, noted that the fish looked good. Examiner notified staff of some flow meter issues, including the lower water volume in raceway 9. By Nov. 18, 2013, the coho had been on surface water (400 gpm). The fish were in good health, and the exam showed clean skin (no parasites) and no bacteria (by culture on TSA/TYES, 0+/10). Three of the 10 fish examined had an unidentified parasite encysted in the gills.

Because of the finding of IHNV in the yearling BY 12 URB juveniles (Jan. 15th), a special inspection for virus was instigated for the BY12 coho on Jan. 27th, 2014. Results were negative for virus (0+/30 x 5 fish pools). The fish were also negative for gram negative bacteria (0+/30 on TSA & TYES agar) and for *R. salmoninarum* (0+/30 by DFAT). The coho remained healthy and clear of virus and bacteria in the pre-release exam done on March 14th: negative for virus (0+/12 x 5 fish pools), gram-negative bacteria (0+/30 on TYES, TSA) and *R. salmoninarum* (0+/30 by DFAT). *Epistylis*, an incidental ectocommensal on the skin, was the only living micro-organism found (10+/10). These fish were moved to the Lost Creek and Stiles Pond acclimation sites, shared with the BY12 Eagle Creek stock coho, and were negative for virus and bacteria on the March 28th, 2014 exams.

Yakima Coho Stock, BY 2012, at Eagle Creek National Fish Hatchery (about 150K fish).

At the end of June 2013, increasing mortalities signaled the onset of an acute infection of bacterial coldwater disease (CWD) in the Yakama coho stock (and in the Eagle Creek BY12 coho). On June 24th, 2013, *Flavobacterium psychrophilum* was cultured from the 20 dead and moribund fish sampled. External exam showed darkened color, pale gills, and some evidence of fin and/or caudal peduncle erosion. Rising water temperatures in the 60's by the first of July helped control the infection and mortalities were reduced with no need for treatment as verified by another visit on July 8th. On Nov. 20, 2013, the Prosser coho looked healthy, with no detections of bacteria on TSA and TYES (0+/10). Some *Epistylis* was found on the skin and gills were slightly clubbed/marginated, the latter likely a result of particulates in the water. The fish continued with no health problems through to their pre-release examination on Feb. 4, 2014. No virus (0+/12 x 5 fish pools on cell culture) or reportable bacteria (0+/30) were detected. A few colonies of *Flavobacterium* were detected on TYES agar (2+/30), but no coldwater disease was noted. The fish were transferred to the Yakima River acclimation sites, via Prosser Hatchery, in March 2014.

Eagle Creek coho stock, BY12, at Eagle Creek National Fish Hatchery

Nearing the end of June 2013, mortality due to acute coldwater disease occurred, with epizootic losses (>0.1% daily for 3 days) in one raceway that warranted treatment with florfenicol-medicated feed. By mid-July, the antibiotic and warming summer water temperatures caused abatement of disease mortality. In November 2013, the fish were negative for bacteria. Birds at Eagle Creek NFH harassed the fish through the winter, resulting in the appearance of stressed fish with shortened gills with an excess of mucus. However, no reportable bacteria or virus was found in the pre-release exam of 60 fish in February 2014 and the fish were healthy and likely pleased to be moving over to the Yakima Basin for acclimation in March.

After transfer to Washington, the Eagle Creek stock coho shared the Stiles and Lost Creek Acclimation sites with the Prosser stock of coho, and in the March 28 pre-release exams at each site, the BY12 coho were negative for virus (0+/12 x 5 fish pools in cell culture), for *R. salmoninarum* (0+/30, DFAT) and for reportable bacteria (0+/30, TSA).

Eagle Creek Coho Stock, BY2013, at Eagle Creek National Fish Hatchery

The Eagle Creek coho brood adults, spawned in two takes in late October 2013, were healthy with no detections of virus (0+/210), or reportable bacteria (0+/30 on TSA). Most were positive for *C. shasta* (14+/20). One hundred percent of the 210 adults sampled were at no to low levels of *R. salmoninarum* (less than 0.199 OD by ELISA).

Approximately 550 K BY13 progeny from these Eagle Creek adults will be used to supplement yearling outplants to the Yakima River in 2015 for the Mitchell Act program. The first exam of these progeny occurred on March 19th, 2014--the fish were healthy with no detection of virus (0+/60). In April, a follow-up exam and necropsy showed no infections of bacteria or parasites (0+/10). At this time, the bird predators were intimidating the coho however the water temperatures were still low (45 F) and the staff planned to split the fish to half densities. In early June, bacterial coldwater disease caused some elevated mortality in a couple raceways as the water temperatures approached 58 F. *Flavobacterium psychrophilum* was detected in seven of ten fish sampled. As the temperatures stayed in the 48-52 F range, mortality from coldwater disease became elevated in all raceways by June 16th. Mortality remained elevated through June 26th so the manager decided to treat the fish with florfenicol but the forces worked against this decision via a delayed feed delivery of the wrong size. By July 1st, the marking of the coho was almost done and shortly thereafter, the water temperatures became high enough to quell the mortalities without antibiotic treatment.

Upriver Bright Fall Chinook Salmon

Yakima Stock, URB Chinook, BY 2013, Prosser Hatchery

The adults (146 females and 60 males) were sampled on Oct.24, 30, and Nov. 6 in 2013. There were no detections of virus (0+/146, 0+/60), no 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 145 females, 60 males). The one female had very high level of *R. salmoninarum* (>1.0 OD) and her eggs should have been culled to reduce the risk of BKD in this cohort, especially if the juveniles were to be crowded or stressed.

The ponding health exam of the fry occurred on March 17th, 2014. *Trichodina* was found on the skin 2 of 10 fish, surprising in that they are on well water. It is supposed that either the surface water had backed up into the well piping for the large raceways or else there was a leaky valve. There were no signs of the Bacterial Gill Disease (BGD) bacteria. On May 1st, the manager called because of the losses of ~300 fish in two of the three raceways, just following marking. The raceway screens had already been pulled and mortality was down to ~20 fish on the day of the exam on May 2nd. Some normal appearing fish were netted into a bucket and died within five minutes, a sign of respiratory distress. Their gills showed signs of advanced Amoebic Gill Disease (gross and microscopic evidence of gill fusion, some fungus, *Ichthyobodo*, and presence of amoeba in 10+/10 fish) as well as some signs of BGD caused by *F. branchiophylum* (long, gram-negative filamentous rods in 5+/6 fish). No virus was detected by cell culture (0+/12 x 5 fish pools). To reduce amoeba infestation and the potential for a full blown episode of BGD, it was recommended to increase the water flows to ~600 gpm by supplementing with surface water until the fish were completely released to the Yakima River in May.

Yakima Stock, URB Chinook, BY 2012 (yearling program)

As in past years, poor viability and mortalities occur in the yearling program around the first spring smolt, the second fall smolt and just prior to release as yearlings. Short term solutions are the use of salt (0.5 to 1%) to reduce stress and the use of 100% well water until the danger of *A. salmonicida* and bacterial gill disease have passed.

July 2nd, 2013, a diagnostic exam of the juveniles revealed no bacterial infections (0+/10 by TSA/TYES and 0+/10 by DFAT) and no parasites/problems on the skin and gills although fish behavior indicated that something was wrong. Observations of the fish on July 15th revealed normal looking fish and low mortality. By Aug. 26, 2013, ~ 500 of the juveniles hung at the rear 1/8th of the raceway. They were afflicted with various physical ailments (some unilateral exophthalmia in the left eye and some right eyes missing). No bacteria were detected by DFAT (0+/5) or culture on TYES/TSA agar (0+/10). The *Hexamita* parasite caused some inflammation in the gut, and a variety of parasites (Ich, roundworms)

and fungus were seen on the skin and gills. A recommendation was made to cull the moribund fish, to increase the turnover of the well water, and to watch out for increasing mortality. It was suspected that these fish were undergoing another smoltification as they seemed somewhat stressed and there was some scale loss. Salt was also recommended to alleviate stress. By Nov. 18, 2013, ~70% of the population had tail rot. These fish were treated with formalin for 3 consecutive treatments twice before and on this exam date. When stressed, such as caused by a walk-by on the catwalk by an examiner, the fish had difficulty breathing. In addition, the fish were smolting, showing a silvery appearance and descaling. Exam of gills and kidney from 10 fish showed *F. branchiophilum* (10+/10), and systemic infections of furunculosis (3+/10 on TSA) and motile aeromonads (5+/10, on TSA). No virus or *R. salmoninarum* was detected. A ten day treatment with oxytetracycline feed was recommended to control the systemic bacteria. Concurrent with the antibiotic feed, fish were to be treated with 100 ppm 35% Perox-Aid in a flow-through treatment every other day for 3 days to help control the tail rot. Mechanical issues prevented immediate treatment for about 2 weeks. The 100 ppm was not effective so the dose was increased to a 500 ppm static treatment every other day for 3 days. There was increased mortality after the first two treatments (300-500 fish), but mortality was reduced to normal for this stock at this time of year (~20 fish/day) after the 3rd treatment. It was further recommended to cull the fish with tail rot and to put off marking until the mechanical and disease issues were resolved. Additionally, when appropriate, fish were to be split into 2 raceways.

By January 15, 2014, fish looked stronger, but the tail rot and fungus were still present. Three treatments of Perox-Aid were recommended after marking, with a special emphasis to pay close attention to stress levels during the marking operations. The gills of 10 fish were examined, with findings of hyperplasia, clubbing and excess mucus, however, no *F. branchiophilum* (agent of Bacterial Gill Disease) was found by microscopy. At this exam, sixty fish were also tested for virus and on Jan. 21st, 2014, 11 of the 12 x 5 fish pools were positive for IHNV, a first for the production program at Prosser. It is likely that these fish picked up the virus from the canal water. They may have been more susceptible due to disease and compromises to their immune system. Prior to this detection, the IHN virus had never been detected in the Prosser stocks of coho, fall and summer Chinook (juveniles or adults); however, the salmon adults returning to upriver programs and the wild steelhead do carry the virus and horizontal transmission of the virus from the canal water is the likely source of the infection. The Prosser management personnel made the decision to euthanize the BY12 yearlings to prevent their return as positive virus-positive adults. This appears to be the end of the yearling program at Prosser Hatchery because the annual issues with disease, treatment and labor costs, and space exceed the benefits.

Little White Salmon Upriver Bright Chinook, BY13

The brood adults spawned on Oct. 28rd and Nov. 5th, 2013, at Little White Salmon National Fish Hatchery (LWS NFH), had a 77% prevalence of IHNV (53+/70 three fish pools). Over 92% 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+/19). Their progeny were tested on March 18th, 2014 and found free of virus (0+/60). In April, 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 2014.

Summer Chinook Salmon

Wells Hatchery Stock, Summer Chinook, BY 2013

Samples collected from 150 female adults, spawned on Oct. 16, 2013 at Wells Hatchery, were negative for virus (0+/150). *Renibacterium salmoninarum*, causative agent of BKD, was non-detected to low (less than 0.199 OD by ELISA) in the females (150) and males (60). The eggs for the 150 females were identified according to the female's fish health no. and transferred to Prosser Hatchery where they were kept in quarantine (isolated from other stocks, effluent contained to prevent contamination) on chilled Yakima River water until fish health results were completed. The eggs were then transferred to Marion Drain for rearing.

The progeny were received as eyed eggs at the Marion Drain Facility and reared on well water. On March 17, 2014, a ponding exam of 60 fish, found the lot negative for virus. However, in one of four-to six tanks, there was elevated mortality. This tank did not look clean and had unpicked mortality. It was recommended to split the fish into all available tanks, and turn up the flow to reduce the density. Of course, regular cleaning and aggressive picking of mortalities for the following days was recommended. The fish were to be marked within the next two weeks prior to transfer to acclimation sites (Roza & Nelson Springs).

Changes to the Lower Yakama River Supplementation & Research Program, 2014

The Yakama Nation management staff weighed the benefits vs. the risks of the yearling URB Fall Chinook program and decided to discontinue the program due to annual problems, largely due to disease.

S. Gutenberger, January 26, 2014

*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 Flavobacteria, the gram-negative yellow pigmenters). TSA: Tryptic soy agar (for culture of gram negative bacteria).

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: Financial Training in October, 2013, OMB Circulars in December, 2013, and Travel Policies in March of 2014. One Maintenance Tech. and three Fish Culturists visited Eagle Cr. NFH and learned various ways to use grip struts. They loaded excess grip struts and delivered to Prosser Hatchery.

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 US BOR through BPA schedules 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:

2014 Tours

March 6 Bellingham Community College - 1 student; March 26 McClure - 90 students; March 29 Heritage University -17 students; April 15 Family visit - 3 people; April 24 Wapato Middle School - 42 students; April 29 Mt. Hood Community College - 25 students; May 8 Sunnyside Christian - 45 students; May 11 Random family - 6 people; May 14 Outlook Elementary - 120 students; May 16 Garfield Elementary - 75 students; May 20 Zillah Intermediate - 120 students; May 28 Mabton - 55 students; May 28 Wapato - 25 students; June 2 Grandview - 25 students; June 4 Chief Kamiakin Intermediate - 100 students; June 16 Family from Florida - 3 people; June 18 Chief Kamiakin - 23.

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

A letter, detailing chemical usage is sent to Department of Ecology annually. This plan serves as the Annual Report and covers January 1, 2013 through December 31, 2013:

15 West Yakima Ave.
Suite200
Yakima, WA. 98902

RE: Annual Summary of Chemical Usage for 2013

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 1800 grams of this chemical was used in 2013. 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. A total of 20 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 48 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 250 gallons were used the past year.

The chemicals used were purchased through Argent Chemical Lab in Redmond WA. And 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.

Sincerely,

Joe Blodgett
Yakama Nation Fish Biologist



YKFP crew collecting fall Chinook broodstock from Chandler Canal.



Coho entering denil at Prosser Hatchery.



YKFP crew working in the incubation room.