Fall Chinook Acclimation Project (FCAP)

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Nez Perce Tribe Fisheries Production

Introduction and Background

Fall Chinook were once widely distributed in the Snake River from the confluence with the Columbia River upstream to Shoshone Falls, 615 river miles. Construction of the Hells Canyon Dam Complex and the Lower Snake River dams eliminated or severely degraded 530 miles of spawning habitat. The loss of spawning and rearing areas and the degradation of migration habitat were primary reasons that Snake River fall Chinook salmon experienced a dramatic decline in abundance and eventually became listed as a threatened species on 22 April1992.

As mitigation for construction and operation of the four Lower Snake River dams, the Lower Snake River Compensation Plan (LSRCP) constructed Lyons Ferry Hatchery to produce Snake River fall Chinook juveniles. However, Lyons Ferry Hatchery was built on the Snake River downstream of Little Goose Dam (two dams and many miles below the primary natural production area) and prior to 1994 all the fish were released at the hatchery.

During 1994, the *U.S. v Oregon* parties agreed that they should take a more active role in rebuilding the Snake River fall Chinook populations within its critical habitat. As a result, an agreement was developed between the *U.S. v Oregon* parties (Nez Perce Tribe, Yakama Nation, Warm Springs Tribe, Umatilla Tribe, Oregon, Washington, Idaho, National Marine Fisheries Service and the U.S. Fish and Wildlife Service) to begin a supplementation program for Snake River fall Chinook in their remaining critical habitat in the Snake and Clearwater rivers above Lower Granite Dam. This agreement involved producing juvenile fall Chinook (yearlings and subyearlings) at Lyons Ferry Hatchery and then transporting them upstream to be reared for four to ten weeks prior to release in acclimation facilities located on the Snake and Clearwater rivers adjacent to prime spawning habitat.

The U.S. Congress secured funding for construction of acclimation facilities during deliberations over the FY95 budget. Congress instructed the U.S. Army Corp of Engineers (USCOE) through the Lower Snake River Compensation Plan to construct final rearing and acclimation facilities for fall Chinook in the Snake River basin to complement their activities and efforts in compensating for fish lost due to construction of the lower Snake River dams. The Nez Perce Tribe, in conjunction with State and Federal agencies, selected three acclimation sites. Two acclimation facilities were located on the Snake River, at Captain John Rapids and Pittsburg Landing, and one acclimation site was located on the Clearwater River at Big Canyon.

The Captain John Rapids facility is a single in-ground pond while the Pittsburg Landing and Big Canyon sites consist of portable fish rearing tanks assembled and disassembled each year. The sites were selected primarily because of the proximity of spawning habitat for returning adults and good road access. The NPT assumed responsibility for operation and maintenance of the

facilities. The LSRCP was to fund the operations and maintenance of facilities constructed under the plan however, in 1997 the decision was changed and Bonneville Power Administration (BPA) was directed to fund operations and maintenance (O&M) and monitoring and evaluation (M&E) of the facilities. The title of this program is the Fall Chinook Acclimation Project (FCAP).

Mitigation Goals

The Lower Snake River Compensation Plan is for 18,300 adults to return to the project area and 73,200 adults to be harvested below the project area for a total adult mitigation of 91,500. Releases from the Fall Chinook Acclimation project account for 58% of the juvenile production from Lyons Ferry Hatchery, therefore ~ 53,000 adults of the total mitigation and 10,614 adults return to the project area.

Management Objectives

Management objectives for the project include:

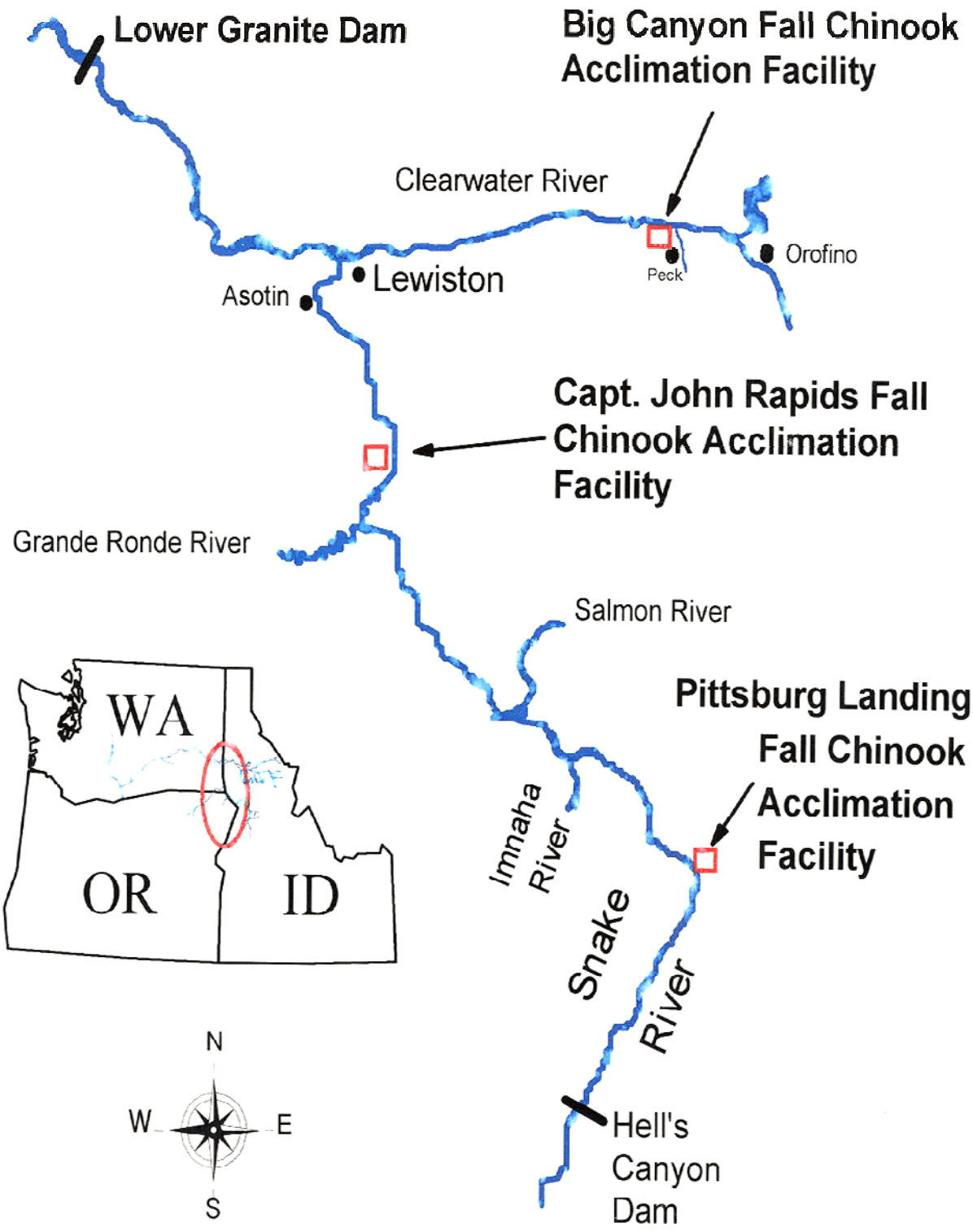
- Increase the natural population of Snake River fall Chinook spawning above Lower Granite Dam.
- Sustain long-term preservation and genetic integrity of the population.
- Keep the ecological and genetic impacts of non-target fish populations within acceptable limits.
- Assist with recovery to remove from ESA listing.
- Provide harvest opportunity.

Monitor and Evaluation Objectives

Primary monitoring and evaluation objectives of the project are:

- Quantify and evaluate pre-release fish health, condition and mark retention.
- Evaluate post-release survival.
- Track migration rates, travel times and survival.
- Conduct redd counts within the project area.
- Provide feedback to co-managers on the results.

Facility Descriptions



Captain John Rapids

- Located on Washington side of Snake River (RM 164), 50’ x 150’ pond.
- Facility setup mid January.
- Water is pumped from Snake River via submersible pumps.
- Receive 150K yearlings Feb 01 @ 13fpp, release April 01 @ 10fpp.

Pittsburg Landing

- Snake River (RM 215), 31 miles downstream from Hells Canyon Dam.
- Consists of 16 – 20’ diameter aluminum tanks.
- Temporary and portable.
- Water pumped from Snake River via four centrifugal electric pumps.
- 150K Yearlings
- 400K Sub-yearlings
- Trasport is shared by NPT FCAP & WDFW tankers.

Big Canyon

- Located on Clearwater (RM 35).
- Facility setup mid Feb.
- River water pumped via two-eight inch centrifugal electric pumps.
- 16 – 20’ diameter aluminum tanks.
- 150K Yearlings.
- 500 K Sub-yearlings
- Transport shared by NPT FCAP & Lyons Ferry Hatchery trucks.

Fall Chinook Releases

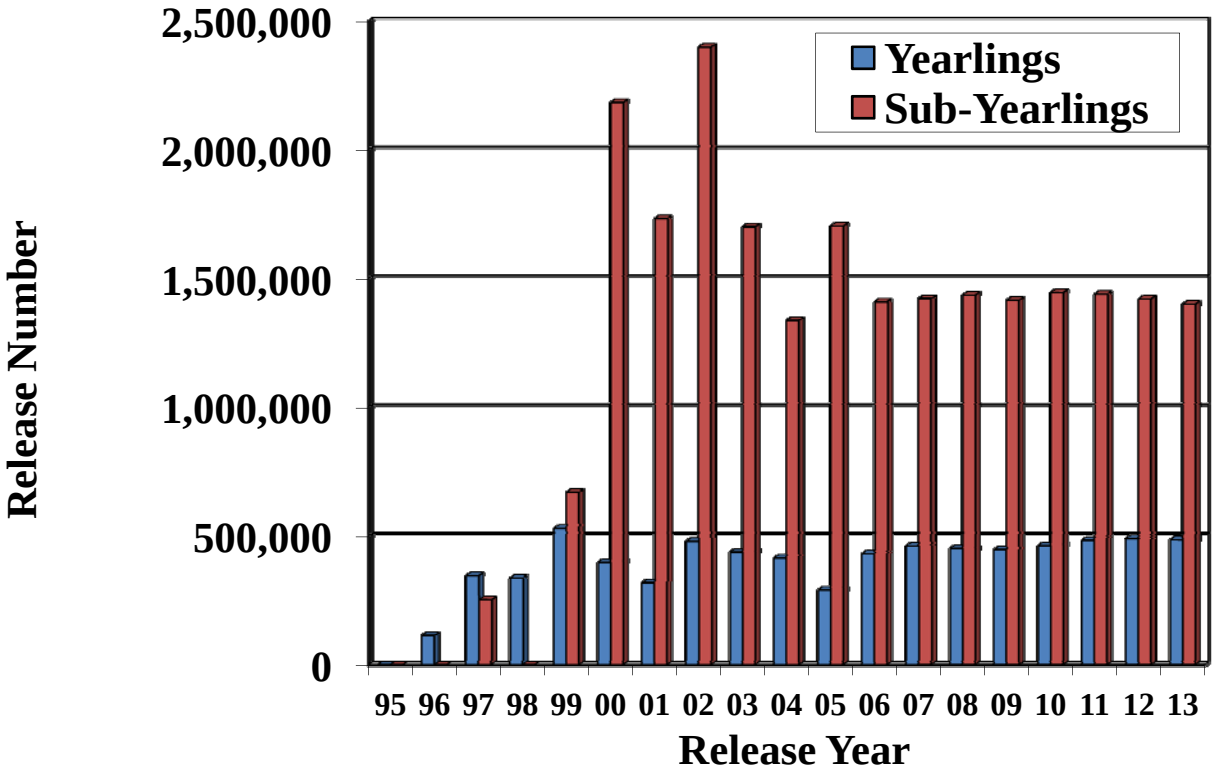
Yearling fall Chinook are transported to Captain John Rapids at 13 fish per pound on Feb 01 each year to create rearing space at Lyons Ferry Hatchery for sub-yearlings. After eight weeks of acclimation approximately 150,000 fish are released at 10 fish per pound on April 01. Pittsburg Landing and Big Canyon Creek each receive approximately 150,000 yearlings Mar 01 at 12 fish per pound and are released after six weeks of acclimation on April 15 at 10 fish per pound.

Sub-yearling fall Chinook are transported from Lyons Ferry Hatchery to the three facilities the first week in May at a target size of 75 fish per pound. Captain John Rapids and Big Canyon Creek each receive approximately 500,000 sub-yearlings and Pittsburg Landing receives 400,000 sub-yearlings. After three weeks of acclimation fish are released on May 21 at a target size of 50 fish per pound. Transfer target size is critical for the acclimation facilities to reach their release target size due to changing environmental conditions throughout spring time runoff.

Total number of yearling and sub-yearling fall Chinook released from the three FCAP facilities since they began are illustrated in Figure 1. Prior to 2008, numbers of both yearlings and subyearling production fluctuated due to work at Lyons Ferry Hatchery to determine the production capacity of the facility. On station release targets were set for both year classes at Lyons Ferry Hatchery and all remaining fish were to be released above Lower Granite Reservoir.

In 2008, the *U.S. v Oregon* Management Agreement prioritized the production numbers of yearling and sub-yearling fall Chinook which have caused FCAP release numbers to remain consistent to the present time.

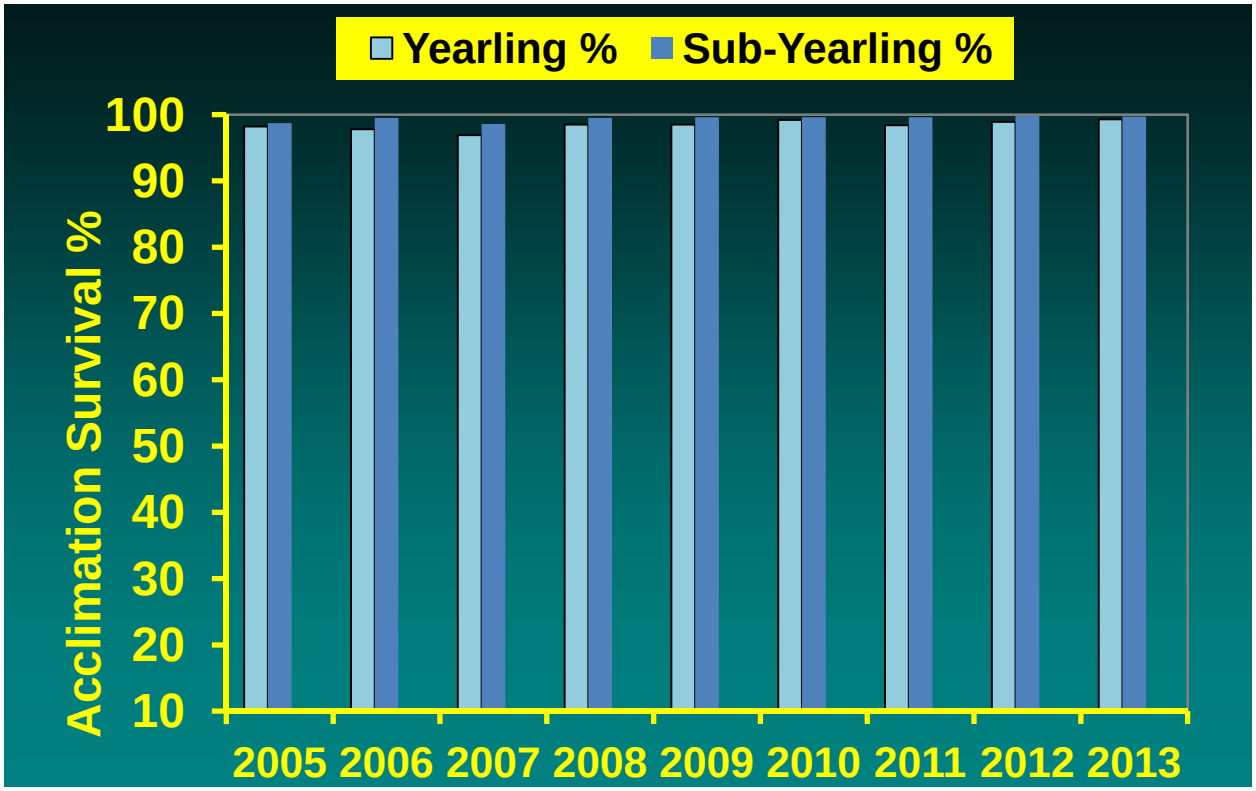
(Figure 1) Total Fall Chinook Releases



Survival

Survival of juvenile fish during rearing at the acclimation facilities is very high (Figure 2), averaging 98% survival for the yearlings and 99% for sub-yearlings. Even though fish are acclimated for a relatively short time, it is a very critical and stressful period throughout the smolting process. The majority of mortalities were due to high incidences of Bacterial Kidney Disease in the yearlings, and Bacteria Gill Disease in the sub-yearlings. After release from the acclimation facilities, survival to Lower Granite Dam is higher for the yearling age class than it is for the sub-yearling age class. Sub-yearlings show more variability in survival and arrival timing to Lower Granite Dam mostly due to the size difference between age classes.

(Figure 2) Acclimation Survival



Fish Health

Prior to transporting juvenile fish from Lyons Ferry Hatchery, which is located in Washington to the acclimation facilities in Idaho, USFWS is contracted to conduct fish health examinations and transport permits are obtained to assure that diseases are not transferred between states. They also sample for the overall condition of the yearlings prior to release.

Fungal outbreaks have occurred on a fairly regular basis in the yearlings at acclimated at the Big Canyon facility on the Clearwater River. We suspect that the fungus is occurring from a large number of adult steelhead that hold near the river intake screens. As a result we began prophylactic formalin treatments which have been successful in preventing the fungal outbreaks.

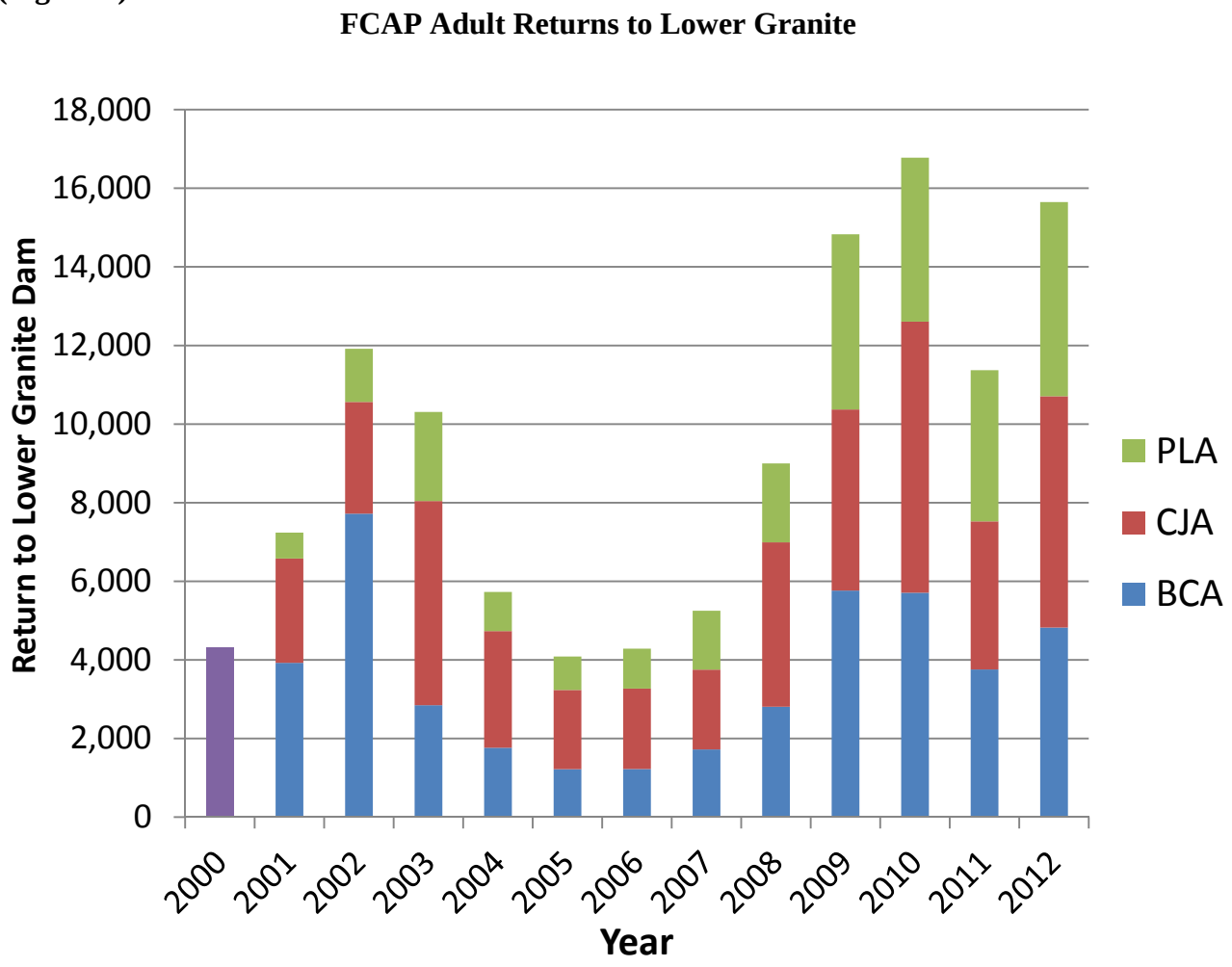
Losses due to Bacterial Kidney Disease and Bacterial Gill Disease at all the facilities have been minimized due to many changes in the fish culture practices at Lyons Ferry Hatchery, which is the key secret to our success.

Adult Returns

Contributions of adults returning to Lower Granite Dam from the Fall Chinook Acclimation facilities have increased from less than 1,000 per year, to over 16,000 in 2010 (Figure 3). Many

factors contributing to the increases or decreases in adult returns could be fish health, release numbers, water year emigration and migration conditions, and ocean conditions.

(Figure 3)



Adaptations in Response to Identified Problems

The Fall Chinook Acclimation Project continually works to improve each facility. Throughout the years we have identified and improved problem areas. Some improvements include:

- installing three phase power for the use of electric pumps with variable speed motor controllers,
- installing sand separators at Captain John Rapids to improve water quality and rearing environment,
- upgrade pump size and style to improve efficiency, reduce maintenance, increase water supply and pump longevity.

To reduce the risk of failures, all facilities are equipped with backup systems which include low water alarms; emergency oxygen systems, secondary pumps and power supplies, and air back flush systems to clear river intake screens. These systems, in conjunction with reliable staff, helps ensure success with the project. These improvements would not be possible if it weren't for funding and support of project implementation from the Bonneville Power Administration.