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# **Yakama Nation's Wetlands and Riparian Restoration Project**

Project Number 1992-06200

## **Fiscal Year 2007 Annual Report Part 2**

**Submitted to:  
Bonneville Power Administration**

**Tracy Hames  
Katrina Strathmann  
Nathan Burkepile  
Jon Shellenberger**



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**NAWCA GRANT**  
**Lower Yakima Wetlands Protection/Restoration II**  
**Annual Report**

June 2008

Tracy Hames, Yakama Nation Wildlife  
Rocky Ross, Washington Department of Fish and Wildlife

## **Byron Ponds (Washington Dept Fish & Wildlife, City of Grandview)**

### Byron Ponds Restoration—NAWCA Funded

For clarification, there are two sources of water on the Byron Unit. Wastewater from the City of Grandview (COG) fills ponds both on the COG property and WDFW property. These ponds are collectively referred to as the “Grandview Ponds”. Groundwater and irrigation return flows are impounded to the south on the Byron Unit to form a long, convoluted pond/wetland system. This system also includes a few separate ponds, which fill from subterranean seepage. This wetland system is collectively referred to as the “Byron Ponds”. The two systems are completely separate from each other.

One of the larger Grandview Ponds dries out before the waterfowl brood rearing season is over. To extend the use of this pond for brood rearing, a swale was excavated to connect it with Byron Pond water to keep it full during this critical time period. A culvert and water control structure was also installed as part of this project, to maintain the crossing and to allow independent water management between the two ponds.

The second phase of the Byron work included the replacement of the culverts at the Mabton siphon crossing. Three small culverts were replaced with a single, 3-foot culvert, which was fitted with a beaver deceiver on the upstream end. The new culvert will allow better water passage through the wetland system.

The third and final phase of Byron enhancement was the installation of a new control gate on an existing concrete headwall. This 3-panel slide gate controls the water elevation in the entire Byron Pond system, impounding water to, and beyond Bus Road, over 1.5 miles away. This new water control replaced the original structure, which was installed in 1947 and had failed completely. The structure will offer better water level control for current

and future wetland management.



**Byron head works at full drawdown and before installation of new control gate**



**New control gate at nearly full pool**

### **Controlled Burning - Match**

The creation of the Byron Ponds nearly 60 years ago flooded some areas with just a few inches of water. Those areas became rank stands of bulrush and cattail with marginal value to waterfowl. Approximately 40 acres were aerially sprayed, and that area, along with 20 additional acres, was burned to remove decadent emergent vegetation. The area was then re-flooded. This process has set succession back and created more diverse habitat conditions with open water, new emergent growth and an influx of smartweed in these shallow areas.

The local fire district assisted in the controlled burn by supplying both staff and equipment over a two-day period. The Fire district staff was instrumental in focusing the fire in the emergent zone and protecting the adjacent grass for nesting cover.





Typical shoreline view of Byron Ponds before treatment



**Controlled burn in progress**



Shoreline view of Byron Ponds after controlled burn



### Carp Control Project - Match

In 1985 a carp control project was implemented on the Byron Ponds Unit. An incomplete kill resulted in the re-infestation of carp within a few years. This coincided with a drop in waterfowl production on this unit, and was probably one of the causative factors. A State Duck Stamp grant was received and used to purchase rotenone and aerial application. A long permitting process ensued, which required many hours of work. The control gate was opened and the level of Byron Ponds was pulled down to its lowest level in many years. Emergent vegetation was burned in shallow water areas to expose all open water. The control gate was closed and rotenone applied. Water samples were taken and analyzed as required. Within 2 weeks the water clarity was substantially improved.

Bluegill and largemouth bass will be planted in Byron Ponds to prey on carp fry as they slowly enter the system via irrigation tail water.

### City of Grandview—Water Treatment Facility - Match

The City of Grandview (COG) operates a water treatment facility adjacent to the north boundary of the Byron Unit. Typically, between February and April, the facility releases effluent into a myriad of small swales, creating nearly 100 permanent and ephemeral ponds on 1,778 acres of COG and Department of Fish & Wildlife lands. The COG released 49 million gallons of water into these ponds in 2006 and 35 million gallons in 2007. Due to an influx of industry into the community, COG was able to release over 80 million gallons of effluent in 2008, a record for a spring release. All pond basins were filled to capacity, creating approximately 121 acres of open, shallow water habitat.



One of many ephemeral ponds filled by the City of Grandview's Water Treatment Facility

## **Meninick Wildlife Area (Yakama Nation)**

Hydrologic Reconnection – Grant

### **Hydrologic Monitoring - Match**

This activity involved the restoration of a Yakima River side channel that was disconnected by a levee in the 1940's. The levee was constructed originally to protect farm and grazing lands from Yakima River floods. The land previously protected is now in protected and managed by the Yakama Nation for wildlife and cultural resource benefits. Restoration involved breaching of the levee where the channel historically crossed it. Because the levee also is used as an access road to the property, it was not totally removed. The channel was stabilized at the breach site with large basalt rock (3-6 foot diameter). A rock roadway was constructed over the large rock to allow for seasonal vehicle crossing. Reconnection occurred during December 2007. As soon as the project was complete, water flowed across the levee site, providing hydrologic reconnection to the channel and wetland areas below. Students and faculty from Central Washington University have been monitoring pre-project hydrologic conditions. They will continue the monitoring activities during the coming year to document hydrologic response to the restoration.



Completed reconnection, Menenick Wildlife Area.



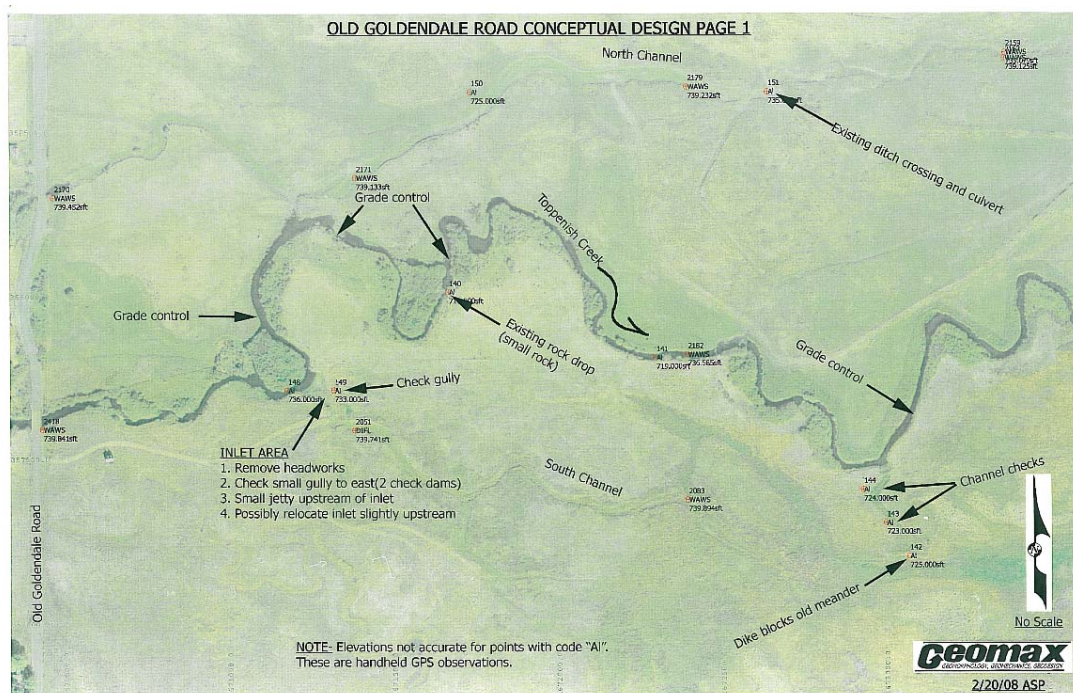
View of channel looking upstream.



## Old Goldendale Wildlife Area (Yakama Nation, Toppenish NWR)

### Wetland Reconnection – Grant and Match

Implementation of this hydrologic reconnection project will occur in August and September 2008. Design plan are nearly complete. Large rock structures will be placed in Toppenish Creek to lift the grade of the creek to pre-incision conditions. This will allow the restoration of wetland and side channel hydrology to the wildlife areas. Channels will be constructed to allow flow and fish passage through the wetland area. Spillways will allow floodwaters to pass through the area. Water control structures will allow for vegetation management.



Old Goldendale Road Wildlife Area conceptual design.

## Toppenish Creek Pumphouse Wildlife Area (Yakama Nation, Toppenish NWR)

### Spillway Development – Match

### Wetland Water Level Control – Grant



The spillway development of this project was completed in the early 2007. This involved the piping of a large irrigation delivery canal that was impeding floodwater passage through the wildlife area. Three large pipes were installed in the canal. A large spillway was then constructed over the pipes. The spillway elevation is low enough to pass flood flows, but high enough to allow for wetland water level management on the upstream side. The spillway has allowed flood passage across this area for the first time since the 1930's. The structures necessary for wetland water level control will be installed in early to mid 2009. This project will need a time extension to complete this activity.



Aerial view of Toppenish Creek Pumphouse Wildlife Area spillway.



Completed spillway.

## **Mid-Toppenish Wildlife Area (Yakama Nation, NRCS, Pheasants Forever, Yakima Valley Audubon Society)**

### **Hydrologic Reconnection – Match**

### **Monitoring and Re-vegetation - Match**

This project was implemented in 2006. It involved the installation of 28 large rock grade control structures. Over 25 miles of creek channel reconnection occurred, with over 1,400 acres of wetlands restored. This project has received much publicity. An article written by staff from the Natural Resources Conservation Service is attached to this report. Native grasses were planted to a portion of the project area in the fall of 2007 using Pheasants Forever funds. Groundwater and wildlife monitoring activities are ongoing on this site. Monitoring activities are being conducted by the Yakama Nation, The Yakima Valley Audubon Society, and The Washington Waterfowl Association.





Aerial view of Mid\_Toppenish Creek restoration project.



Grade control structure – Mid-Toppenish Creek Restoration Project

## **North Satus Wildlife Area (Yakama Nation, Bureau Of Reclamation)**

### **Hydrologic Reconnection – Match**

This project involved the construction of a grade control structure in an incised side channel of the Yakima River. This structure allows stable hydrologic reconnection to the Satus Wildlife Area. This work was completed in 2006.



***Grade control structure at North Satus Wildlife Area.***



## **Cost Share from select NAWCA Partners through June 2008**

Not all costs are presented in detail. Cost breakout details will be included in the final report at the end of the project.

### **Yakama Nation**

Toppenish Creek Pumphouse Wildlife Area Spillway construction:	>\$500,000
Lower Satus Creek Wildlife Area Shattuck property purchase	\$361,345
<b>Total for Yakama Nation</b>	<b>\$861,345</b>

### **Washington Department of Fish and Wildlife**

#### **City of Grandview**

<b>Staff Activities and Associated Costs</b>	<b>\$77,108</b>
<b>Goods and Services</b>	
Electrical Power (lift pumps for moist soil units and for growing waterfowl forage crops)	\$21,000
Excavator Rental for Russian olive removal	\$10,794
Yakima Co. Noxious Weed Board (purple loosestrife control)	\$12,811
Private Trapper for live removal of beaver	\$615
Infrastructure for production of winter waterfowl forage	\$129,791
Rotenone for carp control	\$14,040
Helicopter application of rotenone	\$3,231
Materials for beaver deceivers	\$3,926
Helicopter for aerial control of emergent vegetation (set back succession)	\$1,300
Herbicide “ “ “ “ “ “	\$1,620
Burn permit (annual permit; 2 year cost)	\$300
New ASV loader/mower (purchased with Duck Stamp funds, specifically for work in moist soil management conditions)	\$61,280
Bluegill (11,000) predator fish to control carp fry in Byron	\$5,500
Giffen Lake lift pump repair	\$1,500
<u>Herbicide Use (specifically for NAWCA-related projects)</u>	
Multiple products (breakdown available, if needed)	\$10,002



500 ac treated in 2006; 650 ac treated in 2007)

**WDFW Project Equipment Use**

Dozer and Backhoe (for piling Russian olives for burning) \$7,470

**City of Grandview Water Treatment Facility**

Service debt on pumping infrastructure for 2 years \$115,563

Electrical costs for pumping water \$20,000

**Yakima County Fire District 5**

Controlled burn of 50 acres on Byron Ponds; staff & equipment \$2,406

**Grand Total Cost Share for WDFW, COG \$500,261**

**Other Partners**

**Ducks Unlimited**

Indirect Cost donation \$18,163

**Pheasants Forever**

Grass planting >\$75,000

**Washington Waterfowl Association**

Volunteer restoration and monitoring \$5,460

**Yakima Valley Audubon Society**

Volunteer monitoring \$17,200

**Central Washington University**

Hydrologic monitoring \$9,000

**Lloyd Sak**

Equipment operation \$51,241

## Yakima Basin Environmental Education

Volunteer time

Not quantified by report date

**Grand Total for all partners**      **\$1,537,670**



# CONSERVATION *Showcase*

## Program helps restore hydrology, wetlands, cultural resources on Yakama lands

Tracy Hames unfurls a three foot map across the hood of his vehicle. Nearby, birds chirp excitedly as they flutter amid the branches in a willow grove. A pair of ducks takes wing in the distance. Across the expanse of tule reeds, cattails and shallow ponds, shorebirds feed – silently pacing along the water's edge, stabbing at insects with their spear-like beaks.

Even in the heat of the mid-day sun, the land is teeming with life. But this life has returned in abundance only recently – as the result of an expansive and innovative restoration effort.

"We take a different angle on how we do management and restoration," Mr. Hames says sweeping his hand across the map that depicts the 21,000 acre Toppenish Creek restoration project in the Yakima Valley of south-central Washington. Clearly, he doesn't need the map to know where he is or what this project's about. After almost 18 years of leading the project, the Yakama Nation wildlife biologist knows the land like the back of his hand. The map is there for illustrative purposes only.

"We don't ask, 'How can we set this up to provide the most benefit for a specific use?'" he says referring to the Tribe's resource management and restoration philosophy. "We're saying, 'This is an important area for the Yakama people. They've used these areas for thousands of years for a lot of different



*Tribal Wildlife Biologist Tracy Hames, right, and NRCS Tribal Liaison Roger Amerman, pause near one of the 28 engineered grade control structures that have helped restore the natural hydrology to Mid-Toppenish Creek.*

purposes. They've really culturally evolved in these natural areas here."

"We look at this area and ask, 'What did this place look like historically? How did it function ecologically? What's changed since a couple hundred years ago? And what can we do to bring it back to some semblance of – in a modern context – how it was?'"

*Continued page 2*

*At right, NRCS has committed more than \$340,000 to the Yakama Nation's Tribal wetlands restoration efforts, seen here in the foreground with majestic Mt. Adams as a scenic backdrop.*



*“This was a perfect fit for WRP, especially because this gave us an opportunity to contribute to a restoration project on a watershed scale.”*

Roger Amerman  
NRCS Resource  
Conservationist and  
Tribal Liaison

**Fixing the water, restoring the land**

The key to bringing it back, the biologist for the Confederated Tribes and Bands of the Yakama Nation says, is restoring the hydrology. “And that’s where Wetlands Reserve Program (WRP) comes in,” he says.

Mr. Hames says the natural hydrology of Toppenish Creek is significantly different than it was historically. “So,” he says, “we’re trying to restore the hydrology – to get the water working the way it used to. That’s what we’re talking about when we talk about hydrologic restoration. The first thing we want to do on a project like this is ‘fix the water.’ Then you can start working on all of the other components.”

In this case, Mr. Hames says, “the WRP was the key to fixing the water.” The WRP is administered by USDA’s Natural Resources Conservation Service (NRCS)

and provides financial incentives to develop habitat for fish and wildlife on private and Tribal lands.

“This was a perfect fit for WRP,” says NRCS Resource Conservationist and Tribal Liaison Roger Amerman, “especially because this gave us an opportunity to contribute to a restoration project on a watershed scale.”

Mr. Hames explains that historically, Toppenish Creek was just a small stream with multiple channels. Over time, natural levees developed from the heavier substrate flood water deposits, which naturally raised the bed of the main channel higher than the side channels. In addition, beavers built dams to hold the water levels high, which helped flood the wetlands through the side channels.

But in the 1800s there was a concerted effort to remove the beavers and to convert the wetlands to agricultural purposes.

By late 1800s, the beavers were all but gone as were their dams. Eventually, the existing beaver dams failed, the creek busted out, and the creek’s water was captured by a minor side channel to the south in a lower elevation of the flood plain.

When the flood waters came out of the mountains as part of the natural snow runoff cycle – because the water could no longer spread itself out – it caused the main channel of the creek to dig deeper and deeper. It’s a geologic phenomenon known as incision. “Eventually you get a stream so disturbed that even the beavers can’t bring it back on their own,” he says.

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**Bringing back the floods, naturally**  
Consequently, a critical part of the restoration effort focused on restoring the stream's hydrology, so the floods can re-occur. "You can't restore ecosystems and natural flood plain habitat if the land doesn't flood," Mr. Hames says.

Through NRCS' program, the Tribe has installed 28, man-made grade control structures to lift the base level of the creek up several feet, in order to allow the beavers to begin restoring it again and to allow the floods to perform their hydrologic role.

"The next step is to get the beavers in and get them working in the system along with our restoration here," Mr. Hames says. There's evidence, he says, that the beavers are already returning.

"Eventually," Mr. Hames says, "we'll have a channel running with wetlands and side channels that flood and drain according to the water that's coming down through the system here."

Before designing and installing the structures, the NRCS, worked with the Tribe, Ducks Unlimited, and Geomax Inc. to develop a topographic survey of the floodplain. In the end, the 28 grade control structures affected 1600 acres of restored floodplain wetlands.

**A kinder and gentler structure**  
"They look like real simple structures, but there's a lot of engineering in them," Mr. Hames says standing atop a row of the columnar basalt rocks, which comprise the structure and stretch across

the stream. "The rock is taken from a place here on the reservation and the structures are engineered such that they form and inverted 'V' so the point of the 'V' faces upstream, forcing the flow toward the middle of the stream to reduce bank erosion. They also act like natural cascades, making it much easier for the



*With the grade control structures in place, a backhoe operator breaches a temporary de-watering dam, allowing water from Mid-Toppenish Creek to flow along its historic channel. (Photo courtesy Tracy Hames.)*

fish to pass upstream – unlike many irrigation structures," he says, kneeling near the spot where the clear water cascades gently over the rocks into a shallow pool about a foot below. At first glance, it's hard to believe it's a man-made structure.

But Hames says the lack of obvious engineering is by design.

"You go out on this project and you don't see a three-mile dike," Mr. Hames says. "You don't see big, ugly structures you have to put in for your management. Visitors come to the project and often say, 'What did you do here? I don't see any management.' It's not obvious," he says. "and we don't want it to be obvious."

NRCS' Amerman says the natural look and feel of the structures required a "softer engineering approach" that his

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*"You can't restore ecosystems and natural flood plain habitat if the land doesn't flood"*

Tracy Hames, Wildlife Biologist, Yakama Nation

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agency utilizes often in its restoration efforts. These "softer" engineering practices, Mr. Amerman says, rely less on concrete and steel and more on working with nature's ecosystems and processes.

"Success in this project is measured by the great natural restoration improvements across the landscape," he says, "yet one can barely discern that humans have been working there." NRCS' Amerman says that engineering with nature tends to yield better results in the long run. "Plus," he says, "the structures generally require less maintenance and are more cost-efficient over time."

The rock water control structures are also kinder and gentler for fish. "Fish coming upstream can swim right through these points," Hames says pointing to where the water spills over the rocks. "Because like a notch in a beaver dam," he says, "the water doesn't churn coming through the structure. That's important for fish heading downstream, too."

This fish-friendly aspect of the design is especially important because Toppenish Creek and Satus Creek (the two watersheds contained on the Yakama Nation) are responsible for somewhere between 50 and 75 percent of all of the Mid-Columbia Steelhead production in the Yakima River Basin, Mr. Hames says. "This species was listed as 'threatened' a few years ago," he says, "so that makes



*In addition to restoring wetland hydrology, upland plantings, like this stand of basin wild rye, were established to enhance wildlife habitat throughout the restoration project.*

Toppenish Creek the most important place for steelhead in the Yakima basin right now."

After conducting fish population surveys, biologists discovered that the juvenile steelhead come down the stream with the winter rains as early as November each year. "We found out that they're hanging out in this area over the winter where, historically, there were beaver dams, wetlands and side channels," he says. "When we catch them in November and December they're only 3-4 inches, but when we catch them later in the spring, they're significantly

larger. We've discovered that this is an important winter rearing area for the steelhead."

That discovery was a revelation for researchers. And for Hames, it underscored the importance of restoring the natural conditions in the flat, lower elevation wetland areas. "Fish need complex habitat like those found in wetland areas like this so they can stay away from predators, so they can have the bugs – all the things they need to survive," he says.

With the project only a year old, it's too early to tell if the restoration efforts have had a positive impact on the steelhead numbers, but the Tribe is closely monitoring the fish population and a number of other environmental conditions, including ground water levels.

"What we've documented here is that

*Continued page 5*

*"...one can barely discern that humans have been working there."*

Roger Amerman  
NRCS Resource  
Conservationist and Tribal  
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*“We want to restore areas that can actually be of use to the Yakama people.”*

Tracy Hames, Wildlife Biologist, Yakama Nation

once we'd put one of these grade control structures in, the wells influenced by that structure rose two feet,” Mr. Hames says. “So we were immediately affecting the groundwater resources.” That’s important, he says, because a significant portion of the water flow from creeks and rivers occurs underground.

**Monitor, learn and tweak**

The Yakama Nation is also monitoring wildlife response, and have vegetation transects, photo points, and flow gages in place – all to monitor and evaluate the restoration impacts.



*Above, Katrina Strathmann, restoration biologist, (left) and Camella George, vegetation technician, are conducting plant inventories throughout the riparian corridors of the project to determine the effects of restoration activities on plant communities.*

Monitoring is a critical component in managing the restoration, Mr. Hames says, because the basin’s hydrology remains altered due to upstream irrigation. “Even once you get the channels back,” he says, “the water still isn’t acting the way it did historically, because upstream from us there have been impacts. What that means is sometimes you use water level control as part of management,” Mr. Hames says. “We use these water level control structures to raise and lower the water levels in the wetlands to mimic the natural conditions.”

He admits that because of the size and scope of the project, managers may “need to do some tweaking here.” But, he says, that’s one of the design advantages of these structures. “If we need to lower the elevation, we can do so fairly easily with a backhoe or other piece of machinery,” Mr. Hames says. “That’s the beauty of this kind of work.”

**Restoring resources, restoring culture**

“It’s not about emphasizing one resource over another,” he says. “It’s about bringing the watershed back into balance, as it was years ago. By re-creating these landscapes from top-to-bottom, the Yakamas look at this as cultural restoration – not just resource restoration,” Mr. Hames says.

“We want to restore areas that can actually be of use to the Yakama people. We want them out here interacting with their landscape,” he says, “and to bring back the cultural resources of the Yakama people.”

“When you see what the restoration of these natural resources means to the Yakama Nation,” NRCS’ Amerman says, “you realize that WRP isn’t just about wetlands. It’s also about people. It’s about restoring

hope. It’s about restoring a unique plateau heritage that is intimately connected with the natural world. “And,” he says, “it’s about perpetuating and restoring the cultural watershed of the Yakama people.”

*Written and photographed by Ron Nichols, NRCS, July 2007*

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