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**HABITAT PROGRAM
TECHNICAL APPLICATIONS DIVISION**

**Sunnyside Wildlife Area Fish Passage Barrier and Fish Screen Scoping and
Correction Report**

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This report is also available in a pdf format at:
http://wdfw.wa.gov/hab/tapps/tapps_prods.htm

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Introduction

This report summarizes work accomplished on the Sunnyside Wildlife Area (SWA) to correct fish passage barriers and non-compliant surface water diversions identified in the *Sunnyside Wildlife Area Fish Retrofit (SWAFR)* report, (WDFW, October 2002). This report is a continuation of the effort to bring WDFW-owned lands into compliance with RCW 77.57.030, which states that “a dam or obstruction across or in a stream shall be fitted with a durable and efficient fishway...”, and RCW 77.57.010, which states that “a diversion device used for conducting water from a lake, river, or stream for any purpose shall be equipped with a fish guard...”

The SWAFR discusses the potential for salmonid habitat restoration on the SWA, as it relates to fish passage barriers located both within and outside of the wildlife area boundary. The discussion presented herein, however, is limited to the scoping and correction of fish passage barriers located within the SWA only. In this regard, three non-compliant features were located on the SWA, which required repair, with all three being located within the Sunnyside subunit of the SWA, while no features were found on the Byron, I-82, Rattlesnake Slope, and Thorton subunits. Of these three features, one was a culvert (site 981382), one was a dam (site 981380), and the third a diversion pump (site 981378) associated with site 981380¹.

Site Description

The SWA is located in the lower Yakima River valley, and consists of five major subunits. These are the Byron, Thorton, Rattlesnake Slope, I-82, and Sunnyside subunits (Figure 1). The Byron subunit is located south of the Yakima River, to the north of Highway 22, and adjacent to the City of Grandview wastewater treatment plant. The Thorton subunit is located on the headwaters of Snipes Creek, on uplands north of Prosser. The Rattlesnake Slope subunit is located on uplands north of Benton City and west of the ‘Horn’ reach of the Yakima River. The I-82 subunit is situated along the Yakima River north of Toppenish, and is primarily riparian forestland with ponds excavated as borrow pits during the construction of I-82. The Sunnyside subunit, also located adjacent to the Yakima River, is located to the south of the city of Sunnyside.

To a large extent, natural channels comprising the lower reaches of tributary streams in the lower Yakima River valley have been either converted into irrigation conveyance channels or obliterated altogether, as the Yakima River floodplain has been converted to agricultural use. In addition, the hydrology of most natural stream channels has been altered by irrigation withdrawal and return flows.

The land upslope of the Sunnyside subunit has undergone major alteration in this regard. Early plat maps show what appears to be an unaltered stream course, then known locally

¹ Table 1, *Sunnyside Wildlife Area Fish Retrofit report*, WDFW, October 2002

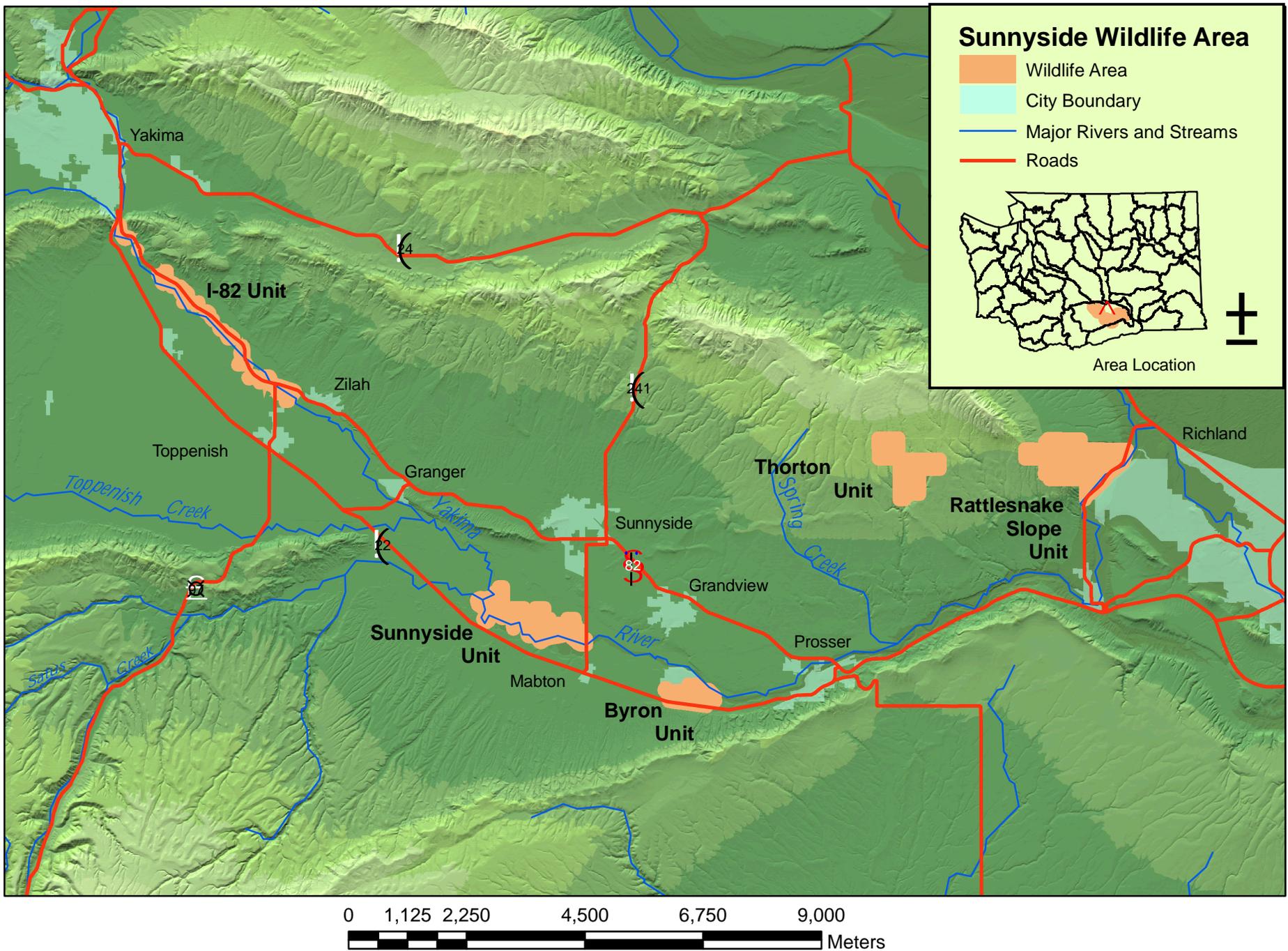


Figure 1. Sunnyside Wildlife Area.

as Sulphur Creek, which flowed from the northeast through the Sunnyside subunit. Historically, this stream spilled out onto the low gradient lowlands along the Yakima River and split into two forks, known as ‘Bos’ and ‘Denny’ creeks, on what is now land within the Sunnyside Wildlife Area. The stream likely fed wetlands along the Yakima River.²

Since the late 1800’s however, the natural drainage features in the area have been highly modified. Two irrigation canals now flow through the Sunnyside subunit in the area of this historic drainage, the Wendell Phillips Canal and the Sulphur Creek Wasteway.

The Wendell Phillips Canal, or ‘Drain Irrigation District 7’ (DID 7) conveys irrigation return flows from diversion points upstream through the SWA, and confluences with the Yakima River at river mile 65.1. This canal currently constitutes the only potential indigenous salmonid habitat on the SWA with identified non-compliant fish passage or diversion structures, and was the focus of restoration efforts summarized in this report (see Photo 1).



Photo 1: Wendell-Phillips Canal (DID 7) between sites 981382 and 981380, within the Sunnyside Wildlife Area.

² R. and L. Saks, pers. Comm.,
Dec 1, 1866 Yakima County Plat Map,
Salmonid Habitat Limiting Factors Analysis (SHLFA), WRIs 37, 38 and 39 Yakima River Watershed, December 2001, p. 143

Methods

Following completion of the inventory of all potential fish-passage barriers and unscreened or inadequately screened diversions on the SWA in 2001, features on the wildlife area that were identified as non-compliant or requiring repair were further evaluated in accordance with chapter 77.57 RCW, and potential impacts to fish life.

The post-inventory scoping process consisted of field evaluations of all potential fish passage barriers and surface water diversions that were not in compliance with state and federal screening criteria identified during the inventory. Following these field evaluations, Region 3 WDFW fish program personnel were interviewed regarding identified fish passage or screening features of concern. These discussions included potential impacts to fish life, the use and purpose of those features identified as requiring removal or retrofit, and the impacts on fish life resulting from land use on surrounding non-WDFW land.

Following these discussions, electroshocking surveys were conducted to further evaluate fish presence potential in targeted waterways. Region 3 fish program personnel Eric Anderson and John Easterbrooks conducted limited fish presence sampling, using an electroshocker in the lower DID 7 canal during winter 2003-2004. In addition, fish presence was assessed by electroshocking by this author during Spring 2005.

Fish Presence Survey and Habitat Assessment

Salmonids were not observed during either of these two sampling events³. However, a more comprehensive evaluation is required to assess utilization by juvenile salmonids, which may vary seasonally and with varying flows in both the DID 7 canal and the Yakima mainstem.

Sites 981378, 981380 and 981382 are located within 850 meters of the confluence with the Yakima River and are the downstream-most features on the DID 7 canal (Figure 2). Site 981382 is an agricultural access road crossing located 78 meters upstream of the confluence with the Yakima River. Site 981380, is a diversion dam located 823 meters upstream of the confluence. Site 981378 is a diversion pump, located 838 meters upstream of the confluence, which is used to divert water out of the DID 7 canal and into an adjacent wetland for waterfowl habitat enhancement.

Following discussions with Region 3 personnel and review of water quality assessment efforts upstream of the SWA on the DID 7 canal, it was agreed that removal of the access road culvert (Site 981382) held potential benefit to rearing juvenile salmonids, originating from the mainstem Yakima River. However, the potential detrimental effects on fish, if allowed access above the dam (site 981380) and into the upper reaches of the DID 7 canal was identified as a concern in light of current degraded water quality, habitat conditions, and fluctuating flows. The SWAFR reported that 5611 m² of physical rearing habitat, and no spawning habitat, exists upstream of site 981382.

³ December 7, 2004 WDFW Internal Memo from Eric Anderson and John Easterbrooks

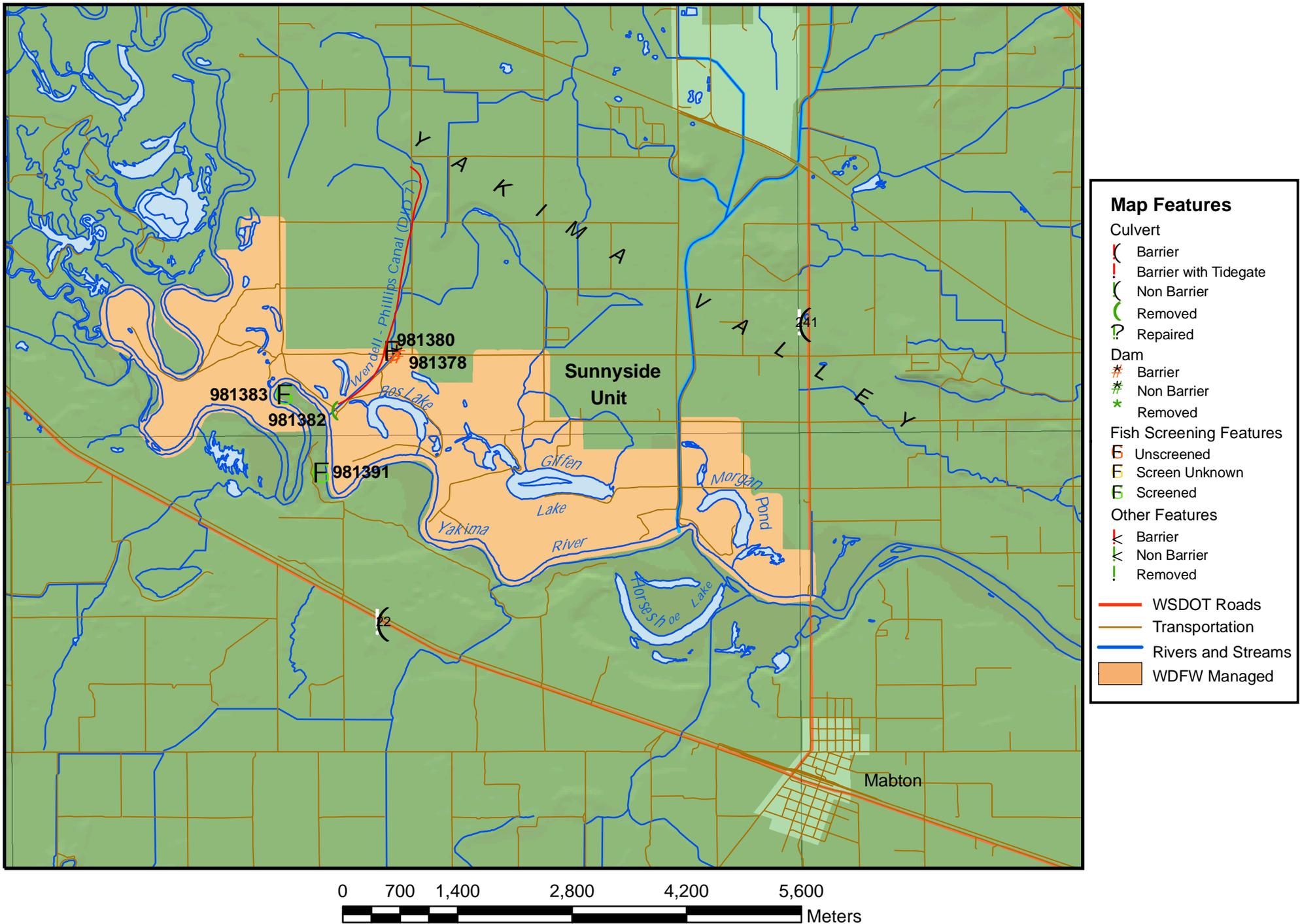


Figure 2. Sunnyside Wildlife Area, Sunnyside Unit.

However, given that flows in the channel are almost entirely supplied by irrigation return flows from agricultural land upstream and numerous fish passage barriers exist upstream of the wildlife area, the quality and accessibility of this habitat, and corresponding value to fish, is presently regarded as low⁴.

While future efforts to address these degraded conditions may contribute to improved rearing habitat in the DID 7 canal, it is unclear whether such restoration will ever take place. Until such efforts occur, allowing fish passage over or around the dam at site 981380 will very likely provide little benefit to salmonids. For this reason, the dam at site 981380 has been left in place, pending improved water quality and habitat restoration upstream of the barrier.

Fish Passage Barrier Correction Summary

In September 2004, after permits were obtained from appropriate agencies, the culvert and associated road fill at site 981382 was removed from the canal prism by WDFW crews (see photos 2 and 3).



Photo 2. Site 981382, prior to access road crossing removal.

⁴*Ibid*



Photo 3: Site 981382 following culvert and road fill removal.

Table 1 below summarizes the location, type, repair status, and corrective action taken on WDFW-owned fish passage and screening features on fish-bearing waters within the SWA.

**Table 1 .
Location, Feature Type and Corrective Action for Features Located in Fish Bearing Waters within the Sunnyside Wildlife Area.**

Site ID	WLA Subunit	Stream	Feature Type	Corrective Action
981378	Sunnyside	DID 7	Pump Diversion	None*
981380	Sunnyside	DID 7	Dam	None**
981382	Sunnyside	DID 7	Culvert	Removed 2004

* Connection to Yakima River mainstem blocked by dam (981380). Therefore, potential impacts of this pump diversion to fish life are negligible

** Fish passage not addressed pending improvement of overall water quality in DID 7. (See Summary and Discussion below)

Summary and Discussion

Field review of all subunits of the SWA confirmed that the Thorton, Rattlesnake Slope, and Byron subunits of the SWA were devoid of fish passage barrier and screening problems. While barrier features were not identified through the barrier inventory process on the I-82 subunit, the series of ponds along the Yakima River are connected by culverts, and there is a riprap and gabion structure at the outlet of ponds 4 and 5. Since these wholly artificial ponds are human-made and managed to provide recreational fishing for spiny ray species and resident trout, and unencumbered fish passage from the Yakima River is not maintained, the features were listed as non-barriers in the SWAFR.

Utilization of these ponds by indigenous juvenile salmonids originating from the Yakima River mainstem would require a shift in management to minimize predation by non-native resident fish species. Management goals need to be clearly defined prior to further evaluation of the fish passage status of the features, especially the outlet structure at ponds 4 and 5, in terms of providing off-channel juvenile salmonid rearing habitat

Spawning adult coho have been observed in tributary streams entering the lower Yakima River downstream of the I-82 reach⁵. Adult coho may also utilize off-channel habitat within the I-82 reach, however it is not known if off-channel, groundwater fed, cold water source areas exist in the area which could support year-round survival of rearing juvenile coho. Since degraded water quality and high summer temperatures in the Yakima mainstem itself are not conducive to over-summer survival of salmonids, identification of potential isolated off-channel rearing areas with more favorable water quality conditions will be a critical first step in any restoration effort.

Migrating adult chinook, steelhead and coho are frequently drawn into irrigation return canals entering the lower Yakima River due to false attraction flows⁶. In addition, efforts to reestablish coho in the Yakima River basin are underway, and increasing numbers of these fish are being observed spawning in lower Yakima River tributaries, including irrigation return canals. A nearby example is Sulphur Creek, an irrigation return canal, which enters the mainstem Yakima within the SWA at RM 61, just downstream of the DID 7 canal. Adult chinook and steelhead are commonly observed at an impassable concrete flume 7.2 miles up Sulphur Creek from the confluence with the mainstem Yakima, and spawning coho salmon have been observed in Sulphur Creek. For example, 75 coho redds were counted in the waterway in 2000⁷. Subsequent surveys to assess juvenile coho survival indicate that impaired water quality likely limits survival of these fish. Yakama Indian Nation biologists have proposed constructing an impassable barrier near the mouth of Sulphur Creek to minimize salmonid mortality due to degraded water quality⁸.

⁵ *Salmonid Habitat Limiting Factors Analysis (SHLFA), WRIAs 37, 38 and 39 Yakima River Watershed, December 2001*

⁶ *Ibid*

⁷ *Pers Comm. Todd Newsome, YIN*

⁸ *Ibid*

While the removal of the culvert barrier at site 981382 on the DID 7 canal provides potential benefit to fish through the restoration of approximately 1,900 m² potential off-channel rearing habitat⁹, it should be viewed as a first step toward improving access to habitat within the DID 7 canal. Until a serious effort is undertaken to achieve an improvement in water and habitat quality on the DID 7 off WDFW-owned lands, removal of the diversion dam at site 981380 will provide little benefit, and could perhaps even be detrimental to salmonids utilizing upstream reaches of the canal. Since the dam at site 981380 remains impassable and fish access from the Yakima River remains blocked, screening of the diversion pump at site 931378 was not pursued.

While spawning and rearing habitat within the boundaries of the greater SWA is largely absent or degraded, the lower reach of the DID 7 canal does provide potential off-channel rearing habitat which could be used by salmonids, especially during the winter months when groundwater-fed flows in DID 7 are likely warmer than the mainstem. The rehabilitation of this and similar off-channel habitats may be beneficial to rearing salmonids, provided water quality is improved to the extent that summer temperatures remain below critical thresholds. This may be especially true for coho salmon, since efforts to re-establish this species are ongoing, and adult spawners are utilizing tributary streams such as the Marion Drain, Sulphur Creek, Spring, and Snipes creeks near and within the SWA¹⁰. While survival to emergence of eggs within redds in Spring, Snipes, and especially Marion Drain is likely to be occurring, in Sulphur Creek it is expected to be minimal due to heavy sediment loading, poor water quality, and high summer temperatures. The DID 7 canal is in close proximity to Satus and Toppenish Creeks, the most productive remaining summer steelhead producing Yakima River tributaries¹¹.

The SWA is located within a floodplain intensively developed for agricultural use, and any realistic assessment of the benefits of fish passage barrier correction on the SWA must be considered in the context of this use and other limiting factors within these watercourses. Impaired water quality and quantity in the lower Yakima River is well documented and is known as a primary limiting factor to anadromous fish populations in the Yakima River Basin.

In some instances, off-channel habitats such as the lower section of altered natural watercourses such as DID 7 canal may provide refuge for juvenile salmonids seeking escape from intolerant conditions in the mainstem Yakima River. Alternatively, elevated temperatures and degraded water quality in the lower Yakima River precludes use by salmonids during the summer months due to thermal barriers to migration. A comprehensive evaluation of tributary and off-channel habitat utilization by salmonids in the lower Yakima River will likely be required to better understand existing fish utilization of altered natural watercourses and the potential benefits of future restoration efforts. In addition, resolution of jurisdictional questions regarding the altered natural watercourses and irrigation return drains needs to be resolved.

⁹ Table 3, *Sunnyside Wildlife Area Fish Retrofit report*, WDFW, October 2002

¹⁰ *Fish Surveys in the Roza-Sunnyside Board of Joint Control Irrigation Drain Network: Summary of Major Findings*, P. Monk, July 2001

¹¹ p. 146 *SHLFA Washington Conservation Commission*, December 2001