

**SHILLAPOO WILDLIFE AREA
FISH PASSAGE AND DIVERSION SCREENING
SCOPING REPORT**

**HABITAT PROGRAM
TECHNICAL APPLICATIONS DIVISION (TAPPS)**

**BY
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**WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
SHILLAPOO WILDLIFE AREA
FISH PASSAGE AND DIVERSION SCREENING SCOPING REPORT**

**TECHNICAL APPLICATIONS DIVISION (TAPPS) – HABITAT PROGRAM
MAY 2007**

Introduction

This report summarizes the results of WDFW’s scoping efforts on the Shillapoo Wildlife Area to correct fish passage barriers and non-compliant surface water diversions identified in the *Shillapoo Wildlife Area and Mt. St. Helens Wildlife Area Fish Passage and Diversion Screening Prioritization Inventory* report (WDFW 2003).¹ 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...”.

Site Description

The Shillapoo Wildlife Area (SWA) is comprised of three distinct management units equaling 2,371 acres of farm and historic wetlands along the Columbia River at River Mile (RM) 98 (Figure 1.). Beginning in 1952, the former Washington State Department of Game (WDG) bought the first parcel (277 acres) of land in the south portion of the Shillapoo lake basin (South Unit). In 1960, WDG purchased the Vancouver Lake Unit. From 1992 through 2001 the remaining land comprising the SWA was purchased and managed by the Washington State Department of Fish and Wildlife.

Prior to 1950, what are now the North Unit (882 acres), the South Unit (1,012 acres) and the Vancouver Lake Unit (477 acres) were interconnected with the Columbia River floodplain, and water levels fluctuated seasonally with the rise and fall of the Columbia (USCOE 1998). Historically, a portion of the North Unit and the South Unit comprised Shillapoo Lake. For the past 50 years, the historic lakebed, which is relatively flat and covers an area of approximately 900 acres, has been used for agriculture. With the SWA’s interconnection with the Columbia River floodplain, the area would have provided seasonal habitat for salmonids. Events that dramatically changed this habitat include the construction of dams upstream on the Columbia and Snake Rivers, the construction of levees around the SWA, and the drainage of Shillapoo Lake accomplished through a network of ditches and pumps. What had once been wetlands on the Columbia River floodplain was converted to dairy and agricultural lands. Today, Clark County Diking District #14 has a long-term maintenance easement with WDFW to

¹ No fish passage or fish safety issues were found on the St. Helens Wildlife Area. Therefore, no address is made in this report.

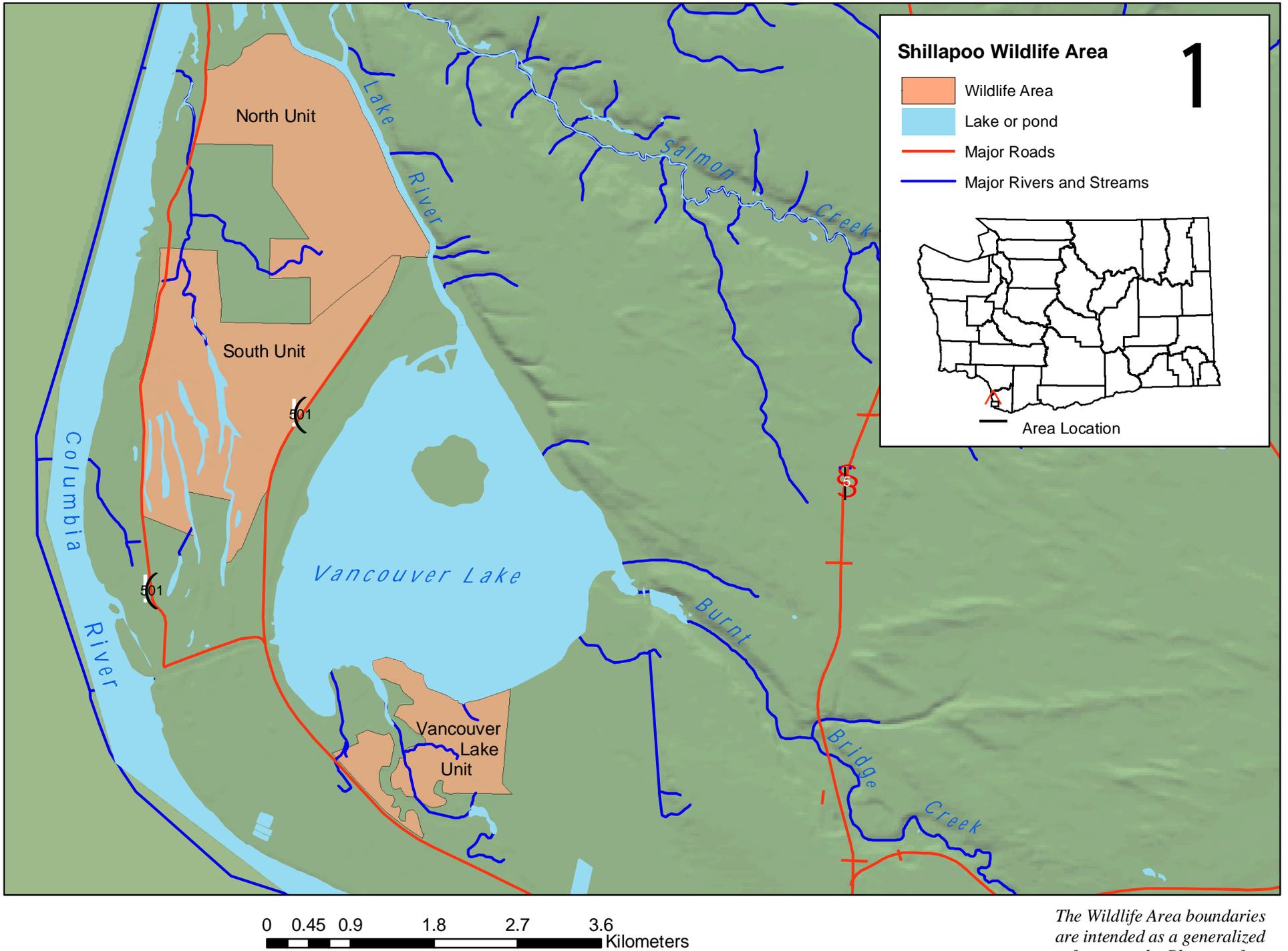


Figure 1. Shillapoo Wildlife Area.

The Wildlife Area boundaries are intended as a generalized reference only. Please, refer to the legal descriptions for specific boundary locations.

maintain the drainage ditches, culvert crossings and expulsion pump within the North and South Units. The District is made up of local farmers who still have in-holdings within the Wildlife Area. The purpose of the maintenance easement is to allow the farmers to drain their lands by spring to pursue their agricultural practices.

Prior to 1950, the Shillapoo Lake Basin would have likely been seasonally utilized by juvenile chinook, coho and steelhead when river levels allowed access. Both resident and sea-run cutthroat trout would have like been present as well. Unfortunately, historical documentation corroborating these inferences is lacking.

Today, wetland cells, drainage swales and Vancouver Lake within the SWA contain a varied assemblage of warmwater fish families. WDFW's Warmwater Fish Program sampled Vancouver Lake during the fall of 1998. A total of 16 species of fish were encountered (Caromile, et al. 2000). Acipenseridae (Sturgeon), Clupeidae (Herring), Cyprinidae (Carps and Minnows), Catostomidae (Suckers), Centrarchidae (Sunfish), Percidae (Perches) and Cottidae (Sculpins) were the primary fish families found in the lake. No salmonids were found during the survey; however, on at least one occasion, juvenile steelhead have been seined from Vancouver Lake adjacent to the area known as the flushing channel (Weinheimer, personal communication 2004).

Today, the SWA is managed to preserve habitat and species diversity for both fish and wildlife resources, maintain healthy populations of game and non-game species, protect and restore native plant communities, and provide diverse opportunities for the public to encounter, utilize, and appreciate wildlife and wildlife areas (Calkins 2005).

Methods

Beginning in February 2003 and ending in January of 2005, site visits were made to the SWA to observe the hydrology and fish use on the North Unit, the South Unit and the Vancouver Lake Unit associated with the previously identified fish passage barrier sites. The primary sources used to verify hydrology were the *Shillapoo Wildlife Area and Mt. St. Helens Wildlife Area Fish Passage and Diversion Screening Prioritization Inventory* report (WDFW 2003), the *Columbia River Ecosystem Restoration at Shillapoo Lake: HYDROLOGIC AND HYDRAULIC ANALYSES, Final Report* (U.S. Corps of Engineers 1998), and Brian Calkins (WDFW Wildlife Area Manager) who accompanied the author on many of the site visits. All of the sites identified as barriers in the inventory report were visited seasonally throughout the period to determine if the habitat could support salmonids. The presence or absence of salmonids and other non-salmonid fish species was determined by direct observation for their presence and existing hydrology. Electroshocking was employed only once on the Vancouver Lake Unit to establish fish presence. Steve Manlow (WDFW Area Habitat Biologist), John Weinheimer (WDFW District Fish Biologist) and Stephen Caromile (WDFW Warmwater Fish Program) were consulted for the presence of salmonids as well as warmwater fish species and the ability of the habitat to support them within the SWA.

Results -North Unit Field Evaluations:

Prior to 1950, what is now the North Unit was a part of the Shillapoo Lake basin within the Columbia River floodplain. Occasional flooding would have undoubtedly led to salmonids being flushed into the unit. After 1950, with the addition of dams on the Columbia and the development of levees and roads (SR 501 and Lower River Road) surrounding the SWA, the frequency of flooding all but ended. The SWA has only flooded once (1996) in the last ten years.

During the course of our field evaluations and through direct observations, it became apparent that the water features and artificial waterways (e.g., drainage ditches within the North Unit) were not salmonid bearing waters. Past land use practices (e.g., levees, drainage ditches, filling and grading) converted a former floodplain into a series of agricultural parcels composed of corn and hay fields. The associated water features were “drag-line” ditches designed to drain the area of surface water run-off. The standing water in the ditches was not tested but appeared eutrophic. No remnant “natural” water features exist today in the North Unit. Details of the North Unit of the SWA and their associated water features are shown in Figure 2. Mosquitofish (*Gambusia affinis*) were found to exist in at least one the drainage swales bordering the North Unit. Their presence was reportedly due to the introduction by the local Mosquito Control Board some years ago throughout the area (Brian Calkins, personal communication 2005). During the winter months, the North Unit receives its water from interior run-off and additional groundwater inflow when the Columbia River is high. Throughout our site visits a lack of water prevailed, however, in years past, standing water within the unit has been documented to a level of 4 feet (USCOE 1998). An expulsion pump and tide gate owned by Clark County Diking District #14, site 991457, is used to discharge the standing water from the North Unit into Lake River at RM 10.5. The pump is activated in the late-winter months to drain the area for agricultural planting in the spring. Once the crops are harvested in the fall, the expulsion pump is shut down. The pump is an unscreened diversion and could harm salmonids and non-salmonids alike if fish found their way into the area due to flooding. The Corp of Engineers as part of an overall project to enhance wetland features is scheduled in 2007 to create two wetland management cells at this location which will modify site 991457. The wetland cells will be behind the primary levee protecting the North Unit. The proposed project will involve providing a screened intake on the Lake River side and allow for the filling of the wetland cells either by gravity flow or by pumping. Once installed, the screens and pumps will be inspected and maintained by wildlife area staff. The area could be flooded during a 100-year flood event. If such an event were to occur, salmonids from either Lake River or the Columbia River could find their way into the these new wetland cells. Once the floodwaters had receded, salmonids would be stranded in the cells. If this were to occur, part of the dike containing the new cells would be breached allowing the salmonids to escape through a channel and new tide gate (Brian Calkins, personal communication 2006). The second outlet for standing water is a culvert/tide gate, site 981451, under the northern cross-levee

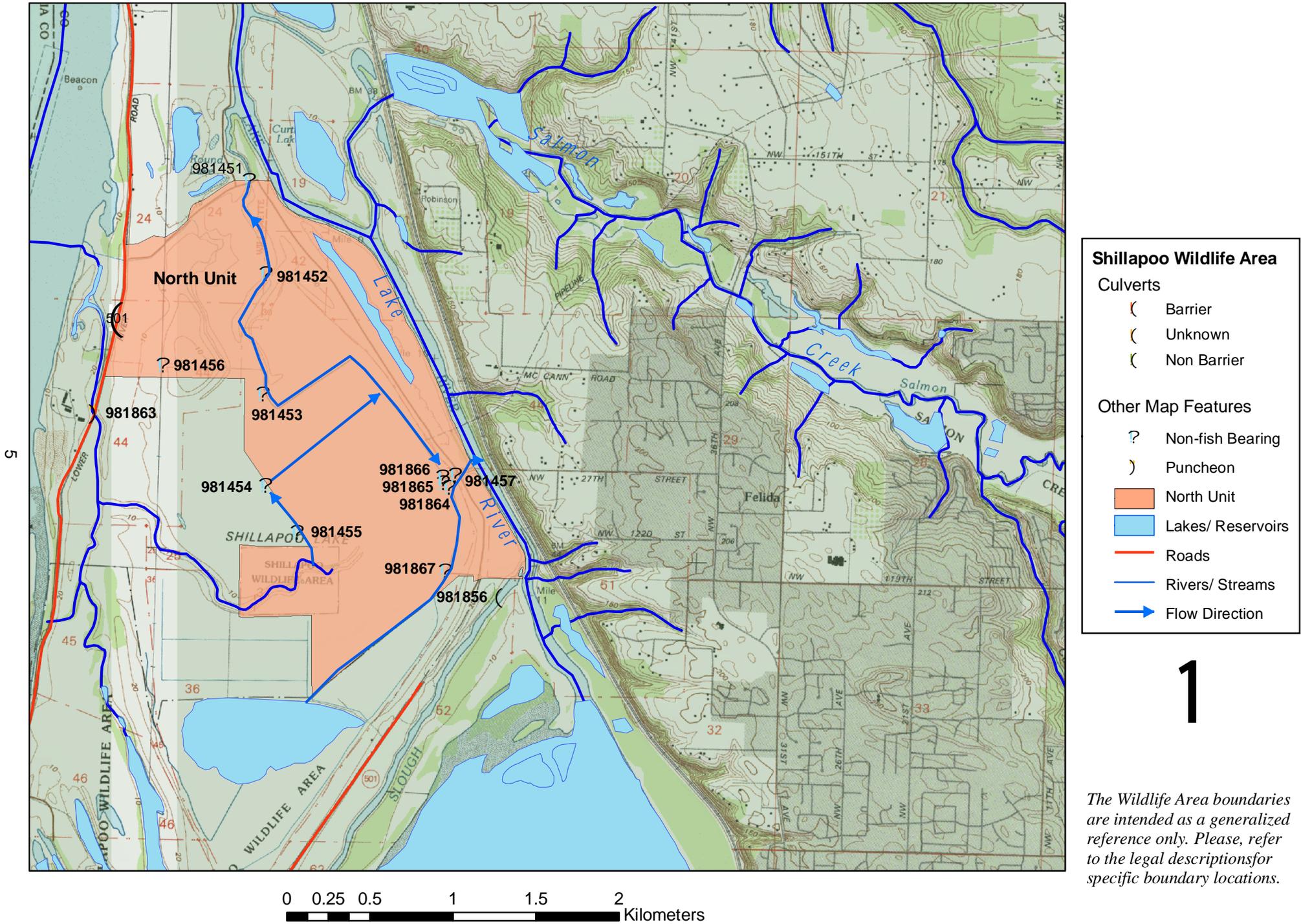


Figure 2. Shillapoo Wildlife Area, North Unit.

The Wildlife Area boundaries are intended as a generalized reference only. Please, refer to the legal descriptions for specific boundary locations.

of the SWA. Historically, a channel connected this feature to Lake River at RM 8.7. Both salmonids and non-salmonids alike would have been present up to site 981451 during flood events on the Columbia and Lake River. The connecting channel was dry throughout our visits and was heavily silted in and choked with Reed Canary grass. Currently, only an artificial watercourse (drainage swale and wetland cell) exists above site 981457 and is considered non-salmonid bearing water. All of the drainage swale features within the North Unit are routinely dredged and maintained by a collection of farmers who still have small in-holdings within the Unit. A maintenance easement between WDFW and the farmers (collectively known as Diking District #14) allows the farmers to perform the work. The work is exempt from both a Hydraulic Permits and Corp 404 permits based on the fact that the drainage swales within the North Unit are considered artificial watercourses and not waters of the State (Steve Manlow, personal communications 2005).

The results of our scoping efforts are summarized in Table 1.

Results - South Unit Field Evaluations:

The South Unit is similar in nature to the North Unit in that what once was a historic floodplain of the Columbia River has now been filled and terraced into wetland cells, and a series of interconnected woodlands, cornfields and pastureland. Details of the South Unit of the SWA and associated water features are shown in Figure 3. A series of remnant sloughs still exist as reminders of the historical Columbia River floodplain. The sloughs are fed by interior runoff and the seasonal operation (fall and winter) of a pump at Langsford Landing on the Columbia River (site 981458). The pump provides water to the South Unit for winter habitat for waterfowl. The pump does not meet WDFW fish protection criteria. An engineering review of the site has been completed. Several modifications to the pump and screens are planned and will be completed in 2007 that will meet WDFW fish protection criteria.

The primary water feature of the South Unit is Matthews Slough and a series of interconnected wetland features. Salmonid access to Matthews Slough is effectively blocked due to significantly altered hydrology due to dikes and a series of existing floodgates downstream and outside the SWA. During the scoping period, the area upstream of site 981459 on Matthews Slough was found to be intermittent, stagnant and highly eutrophic. Without continual flushing of the channel, the area would not support salmonids. Immediately downstream of Matthews Slough, Buckmire Slough picks up at the SWA boundary at SR 501. The tide gate at SR 501, site 981853, and the county crossings at 981854 and 981855 are all fish passage barriers. Buckmire Slough is effectively separated from Lake River by an extended levee running south to north from Vancouver Lake. Prior to the development of the levee, Buckmire Slough would have been part of Lake River and would have likely been inhabited by salmonids. Today the slough is a series of truncated ponds separated by three separate county road crossings. The waters are not salmonid bearing for similar reasons cited for Matthews slough. Non-endemic species, (Cyprinidae and Centrarchidae) do inhabit the sloughs downstream of SR 501. Quite notably large populations of *Cyprinus carpio* have been observed upstream of site 981459 in Matthews Slough (Calkins, personal communications 2004).

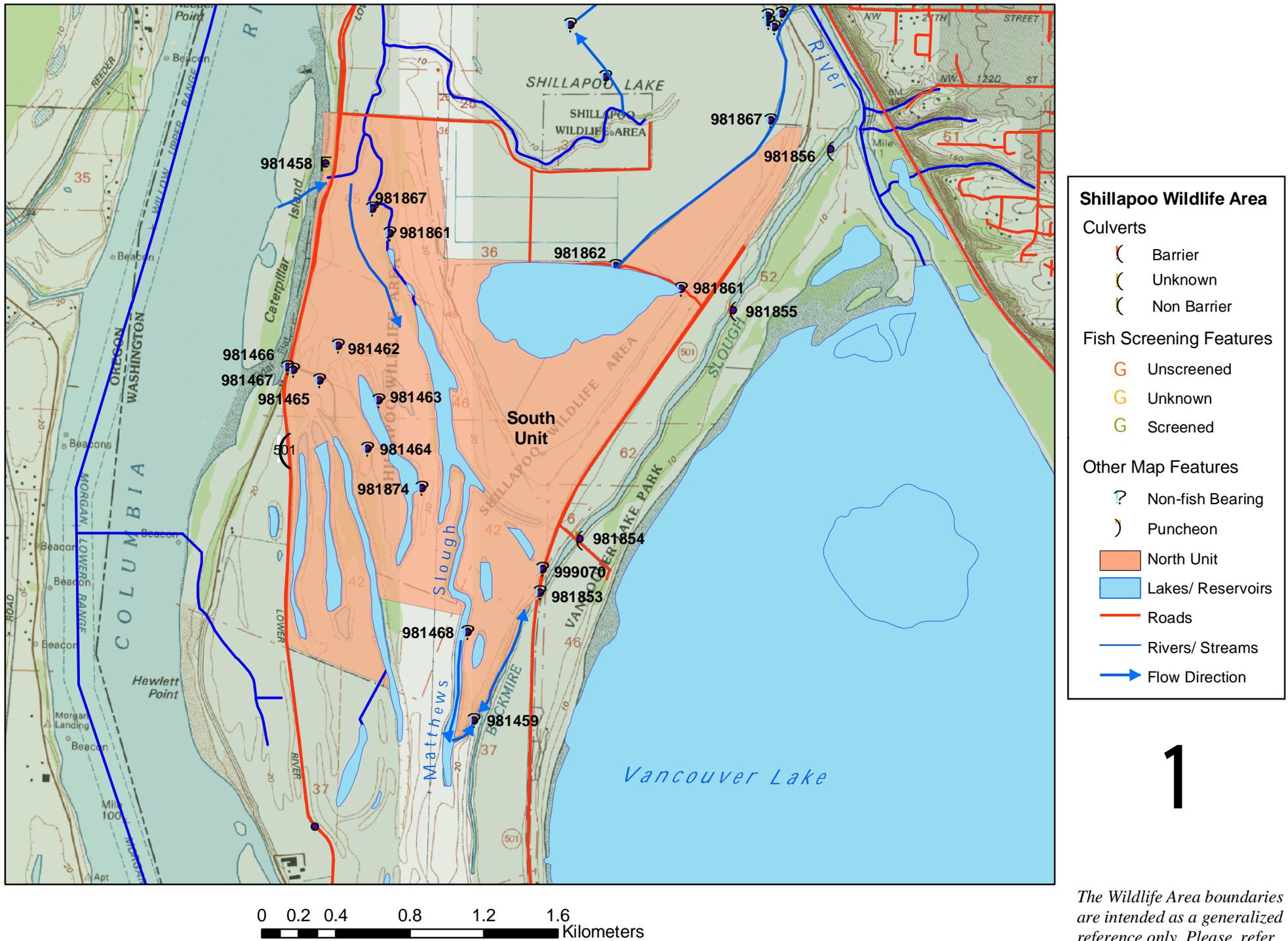


Figure 3. Shillapoo Wildlife Area, South Unit.

The Wildlife Area boundaries are intended as a generalized reference only. Please, refer to the legal descriptions for specific boundary locations.

The results of our scoping efforts are summarized in Table 1.

Results – Vancouver Lake Unit Field Evaluations:

The Vancouver Lake Unit lies approximately 2 miles southeast of the North and South Units of the SWA. The unit is bordered by SR 501 to the southwest, a Clark County road levee to the east and Vancouver Lake to the north. Details of the Vancouver Lake Unit of the SWA and their associated water features are shown in Figure 4.

As recently as 1968, the Unit was backwatered by Vancouver Lake. The area is a mixture of woodlands, wetland cells, and agricultural fields. The area is managed as a pheasant release site and for waterfowl hunting. Beginning in 2003, plans were made to augment the existing wetlands cells with re-use water from the Clark County Public Utility Power Plant. Due to water quality concerns, well water, rather than re-use water is being directed through an established pipeline to the wetland cells as of January 2005. The main purpose of this project is to enhance the native plant community by controlling the hydrology to eradicate the non-native Reed Canary grass (WDFW 2003). There were five water control structures initially identified as fish passage barriers within the Vancouver Lake Unit. All five were associated with wetland cells and no defined egress channels were found to connect directly to Vancouver Lake. Upon review, all of the wetland cells and associated water features behind the identified barriers were found to be artificial features. Both seasonal observations and electroshocking were done to establish fish presence within each wetland cell and adjoining water feature. No fish were found. Historically, the area was inundated by Vancouver Lake (1:24,000 Orthographic Projection: dated 06-18-1968) prior to the completion of the Snake River Dams. The water features within the Lake Vancouver Unit have no defined connection to Vancouver Lake. If in the event of flooding, salmonids could find their way into the associated wetland cells and become stranded. This will be addressed by providing a continuous flow out of the basins monitoring water temperatures and releasing all water prior to temperatures reaching critical levels.

The results of our scoping efforts are summarized in Table 1.

Discussion

Historically, the Shillapoo Wildlife Area (SWA) was a part of the Columbia River floodplain, likely providing seasonal refuge to juvenile salmonids. Over 900 acres of the existing 1,892 acres within the combined North and South Unit would have been inundated by flood flows from the Columbia River prior to 1950. In addition, over half of the 477 acres contained in the Vancouver Lake Unit would have been backwatered by the lake as flood flows occurred on the Columbia River. Beginning in 1950, the landscape of the area was dramatically altered by the placement of levees, a county road and SR 501 around the existing area. The landscape of the Shillapoo Wildlife Area was additionally altered by activities that included ditching, draining, filling and grading for agricultural purposes. With the addition of dams on the Columbia River and Snake River, frequent flood events became a thing of the past. Today, the existing water

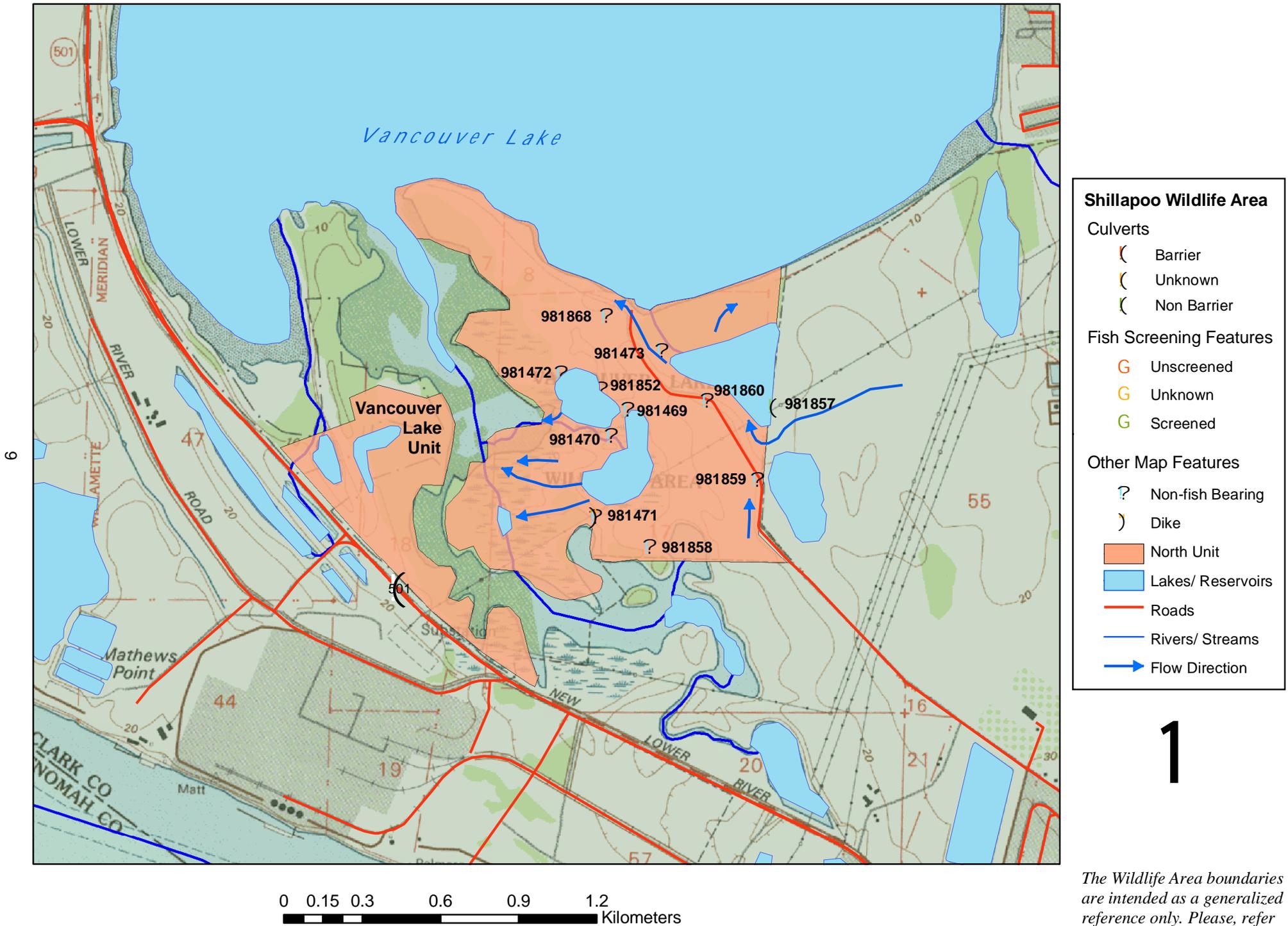


Figure 4. Shillapoo Wildlife Area, Vancouver Lake Unit.

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features (drainage swales, dragline ditches and wetland cells) contained within the SWA function quite differently than the floodplain that characterized the area prior to 1950.

Currently, salmonid access to the SWA and the water egress structures (sites 981451, 981459, 981472, 981471 and 981473) would only occur during flood events on the Columbia River. Since 1950, such events have only occurred four times. During the period of scoping (2003-2005) such events did not occur to afford fish access. The water features within the SWA consist of lowland swales, artificial water courses (ditches), remnant wetland cells, sloughs and ponds. Most were found to be shallow, heavily vegetated, eutrophic and unsuitable for salmonids, thus non-salmonid bearing.

Cyprinids, specifically carp, have been observed above site 981459 on Matthews Slough within the South Unit (Brian Calkins, personal communication 2004) and Mosquitofish (*Gambusia affinis*) were observed within a drainage feature within the North Unit. No fish were found to exist within the water features of the Vancouver Lake Unit.

In summary, the aforementioned landscape conversions to the historic Shillapoo lake basin and the surrounding areas of the Vancouver Lake Unit would place considerable constraints on WDFW to restore the Shillapoo Wildlife Area back to historic active Columbia River floodplain. However, there are two sites where fish protection, i.e., fish screening, is currently being pursued. Those sites include the pump at Langsdorf Landing on the Columbia River (site 981458) and the expulsion pump within the North Unit (site 981457). For site 981458, modifications to the pump and screens are planned and will be completed in 2007 that will meet WDFW fish protection criteria thus precluding juvenile salmonids from being impinged on the existing screen works. The Corp of Engineers as part of an overall project to enhance wetland features within the North Unit will modify site 991457. New pumps and fish screens will be installed with features that will protect fish from entering the wetland cells. (Brian Calkins, personal communication 2006).

Table 1. A two-year investigative summary of sites initially inventoried by WDFW in 2003.

Site ID	Feature Type	Fish Bearing ²	Repair Required	Comments:
North Unit				
981451	Culvert	No	No	Dike Dist. 14
981452	Earthen Dam	No	No	
981453	Culvert	No	No	
981454	Culvert	Non-Salmonids	No	
981455	Culvert	Non-Salmonids	No	Dike Dist. 14
981457	Expulsion pump	Possible salmonids associated with sporadic flooding.	Yes	Dike Dist. 14/WDFW. Will be replaced by the Corp in 2007.
981864	Culvert	No	No	Has been removed.
98165	Culvert	No	No	
981866	Culvert	No	No	Has been removed.
981867	Culvert	No	No	
981456	Culvert	No	No	
South Unit				
981458	Pump	Yes	Yes	New screens and pump. To be completed in 2007.
981459	Culvert	No	No	
981861	Culvert	No	No	Has been removed.
981862	Culvert	No	No	
981468	Culvert	No	No	
Vancouver Lake Unit				
981469	Culvert	No	No	
981470	Culvert	No	No	
981471	Culvert	No	No	
981472	Culvert	No	No	
981473	Culvert	No	No	

² Fish bearing refers only to salmonid bearing waters.

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1:24,000 Orthographic Projection: dated 06-18-1968.