
**PROSPECTUS FOR CLARK COUNTY REGIONAL WETLAND
MITIGATION BANKS**

**Clark County Mitigation Partners, LLC
In Partnership with Clark County Public Works,
The Port of Vancouver, and the City of Battle Ground,
Clark County, Washington**

Submitted By

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Note:

Primary Source of Technical Information:

The Lower Columbia Fish Recovery Board (LCFRB) has produced excellent technical documentation of the existing conditions of watersheds, basins, and sub-basins within Clark County. Most of the information contained in the October 2004 Prospectus was a summary of information contained in the Lower Columbia Salmon and Steelhead Recovery and Sub-basin Plan, Management Plan and Technical Foundation, May 28, 2004.

Information regarding wetlands was taken from the Clark County Washington Regional Wetland Inventory and Strategy (Clark County Public Works, August 2005)

1.0 INTRODUCTION

Clark County Washington is the fastest growing county in the Pacific Northwest and among the fastest growing counties in the nation. Bounded to the south by the Columbia River, and laced with numerous rivers and their tributaries, such as the North and East Forks of the Lewis River, Salmon Creek, and the Washougal River, Clark County is also a place of great natural beauty and outstanding natural resources (**Figure 1**). It is also a place rich with cultural history. The Yakama, Nez Perce, Umatilla, and Warm Springs tribes have treaty rights in the region, and the Cowlitz Tribe is active in the region as well. Clark County is also near the terminus of the famous Lewis & Clark Expedition, sponsored by the U.S. Government in 1805. The County has a long history of supporting the agriculture, fishing, and timber industries. In the recent past, watersheds that are tributaries to the Lower Columbia River have been the focus of major watershed restoration and salmonid recovery efforts, such as those being undertaken by local government agencies like Clark County and Clark Public Utilities, as well as non-government organizations such as the Lower Columbia Fish Recovery Board (LCFRB), Lower Columbia River Estuary Partnership (LCREP), and Fish First.

The Columbia River has the fourth largest watershed¹ in the United States, encompassing a nearly 260,000 square mile area that includes seven states and one Canadian province. The Lower Columbia River Estuary, which encompasses portions of both Washington and Oregon, includes 19 federal regulatory agencies, 22 state agencies, 14 regional agencies, 37 local governments, 14 ports, 4 Treaty Tribes, and 44 non-governmental organizations (**Figure 2**). Over 160 organizations have some management or regulatory role on the lower Columbia River. This approximately 4,300 square mile area is home to 2 million people, over 175 different species of birds, and over 12 rare and endangered species listed under the Endangered Species Act. It is also home to a burgeoning economy supported in part by Bonneville Dam, the source of the world's largest power system. Five deep-water ports moving over 30 million tons of trade worth \$13 billion annually are located within the 146 mile stretch of the Lower Columbia River.

Clark County encompasses a relatively small portion of this area. However, it is currently home to 372,300 residents and this population is expected to nearly triple by the year 2020 (Table 1). Cities within the County include the City of Vancouver (150,700 residents), Camas (14,200 residents), Battle Ground (12,560 residents), Washougal (9,775 residents), Ridgefield (2,185 residents), La Center (1,855 residents), and Yacolt (1,115 residents). Clark County is also the home of several of the major industrial ports, including the Port of Vancouver and the Port of Camas/Washougal.

Table 1: Population Statistics for Clark County

	Number of Residents
City of Vancouver	150,700
City of Camas	14,200
City of Battle Ground	12,560
City of Washougal	9,775
City of Ridgefield	2,185
City of La Center	1,855
City of Yacolt	1,115
Clark County	372,300

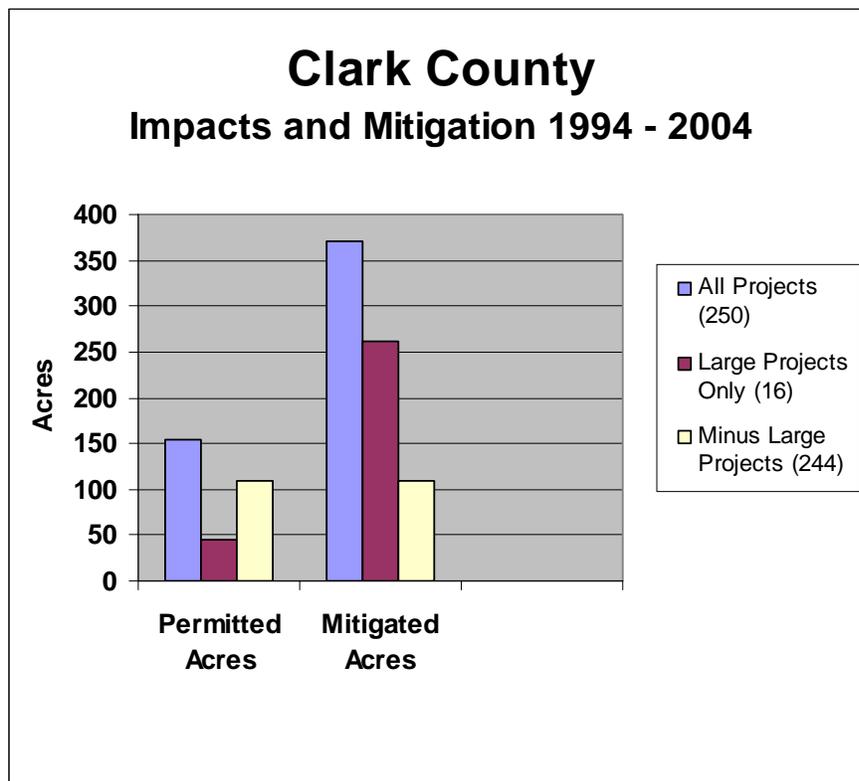
¹ Generally this document uses the term 'watershed' to mean an area draining to a single surface water system. Watersheds occur at a variety of scales. In this sentence the Columbia River watershed is at the largest scale. Most of this report refers to the Lower Columbia River Watershed, generally considered to be from Bonneville Dam to Astoria. Portions of the document which discuss Clark County watersheds utilize the term consistent with Clark County code which defines watersheds as 'an area draining to a single surface water system as shown on the Clark County wetland and watershed map....' (Clark County Code 40.100.070 Definitions).

In 2002, The Columbia River Economic Development Council sponsored a Strategic Development Plan for Clark County. The report established an overall vision and specific goals for economic growth within the County. This report stated that: “Business development will be fostered by creating nodes of growth – zones that have the necessary land base, but also provide infrastructure, access, and amenities in a cost-effective manner. Nodes include areas that are currently developed – such as the Port of Vancouver and Columbia Business Park, as well as new areas, such as the area between Salmon Creek and La Center along the I-5 corridor to be designated as The Discovery Corridor” (CREDC, 2002).

Several of the goals related specifically to how such growth was to be accommodated. Goal 3 related to increasing the industrially zoned land base and infrastructure to support industrially zoned lands. Goal 5 was to support the improvement of the overall efficiency of the permit review process and establish a 90-day permit review benchmark for all projects. Goal 6 speaks for itself: “Remove the constraints for the development of existing industrially zoned properties to allow for efficient development patterns.” Specifics related to Goal 6 include: “Create a publicly owned and operated wetland mitigation bank to provide a convenient and efficient mechanism to convert low-value wetlands that impinge upon the development of industrial and commercial properties.” These goals are significant in that they indicated the general tenor of growth in the area, and the pressure that such growth places upon protecting existing natural resources such as wetlands.

Economic growth within Clark County can also be traced in the regulatory permitting pathway at the local and federal levels. In 2000, Clark County issued 2,767 single-family residential building permits and 467 multi-family building permits. By 2001, those numbers had jumped significantly to 3,551 single-family residential building permits and 1,813 multi-family building permits (www.credc.org). A 2004 review of federal permits issued in Clark County from 1994 to 2004 indicated the following trends;

Table 2: Clark County, Washington. Federally-permitted Wetland Impacts and Mitigation 1994 – 2004 (Table and data provided courtesy of Gail Terzi, USACOE, 2004).



To summarize, 250 projects, comprising 153.3 acres of wetland impact, were mitigated for with 371.4 acres of mitigation activity. A substantial amount of this total acreage was enhancement and preservation of wetland acreage. Of these 250 projects, 16 were very large impacts (44.6 acres representing 29% of the total area of impact in Clark County). Impacts related to these 16 projects provided 261.9 acres of mitigation, or 71% of the total mitigation. To put this in different terms, the projects with large wetland impacts, representing 6% of the total number of projects permitted provided over 70% of the mitigation. As noted previously, a good portion of this mitigation was enhancement and preservation of wetland acreage (not correlated with an increase in wetland acreage). If the large projects are removed from the analysis, there are 234 projects (108.8 acres of impact) left with 109.4 acres of mitigation. This means that the largest projects may be receiving adequate mitigation, while the small, cumulative impacts are unlikely to be meeting the regulatory goal of ‘no net loss of wetland acreage’.

One way to more comprehensively address the ‘no net loss’ requirements, and wetland mitigation in general is to develop wetland mitigation banks in relation to development and infrastructure impacts. Federal Guidance on the Establishment, Use, and Operation of Wetland Mitigation Banks was developed in 1995 (Federal Guidance, 1995). Washington State has had a statute on Wetland Mitigation Banking since 1998. Very few local governments within Washington State have developed regulations specific to wetland mitigation banks over the last decade.

Clark County’s interest in wetland mitigation banking focuses on the wetland impacts, and associated mitigation need related to county capital improvement projects. Planning efforts through evaluation of the current adopted Transportation Improvement Plan (2007-2012) estimated the need for about 90 acres of wetland mitigation related solely to roadway improvement projects. Additional mitigation is needed for other types of capital projects (sewer, stormwater, parks, etc).

Clark County Public Works (CCPW) builds and permits these capital projects independently, meaning that each project often has its own mitigation site (if needed). The time required to permit each project has been increasing and often unpredictable, affecting project construction schedules and sequencing. The county enrolled in the state wetland mitigation banking pilot program in 2004, submitting a prospectus to the Washington State Mitigation Bank Review Team (MBRT). The county’s proposal included six sites located within the Salmon Creek watershed. Only one site, however, has proceeded into this Prospectus; the other five sites were determined to be of insufficient size to be valuable banking sites or needed to be used as mitigation for other projects. The Clark County proposal went out to public notice in September of 2005 (Reference number 200500789), but has not proceeded past that point because of the interest in stronger regional coordination.

At the same time, Habitat Banc Northwest (HBNW), a private entrepreneurial wetland mitigation banking firm, also became interested in establishing a wetland mitigation bank in Clark County, and initially proposed two wetland mitigation bank sites within the county in the fall of 2004. One of these initial sites is located adjacent to the Columbia River (the Steigerwald Lake Wetland Mitigation Bank site) and another on a tributary to Salmon Creek (the City of Battle Ground Wetland Mitigation Bank site). HBNW submitted a Prospectus in the fall of 2004 to the MBRT; however, the HBNW proposal was never reviewed by the MBRT.

Clark County determined in 2006 that stronger regional coordination would be essential toward successfully developing a wetland mitigation bank within the county. Discussions between the MBRT, the County, and HBNW resulted in a strong interest to combine banking efforts and streamline the process by having a single banking approach, application, and combined process. Both HBNW and the County agreed that this would be beneficial and proceeded by contracting with HBNW (through a competitive Request for Proposals process) to work together and form a regional partnership. The partnership also includes the City of Battle Ground and the Port of Vancouver, who are also contracted

independently with HBNW for the purpose of establishing wetland mitigation banks. This Prospectus document is the result of the regional partnership, and proposes one banking effort and approach to address multiple needs. For the purposes of this project, HBNW has established Clark County Mitigation Partners (CCMP), LLC, to work in partnership with Clark County, the Port of Vancouver, the City of Battle Ground, and private partners to permit wetland mitigation bank sites within the region.

Additionally, during the 2006 Legislative Session, the Department of Ecology was provided with \$340,000.00 of specific funding to implement a wetland mitigation program in Clark County. The specific budget language for Department of Ecology, Section 302, sub 17 reads: “\$340,000.00 of the general fund – state appropriation for fiscal year 2007 is provided solely to support development of a wetland mitigation program in Clark County. The program will engage state, local, and federal agencies, private investors, and property owners, and others in the creation of one or more wetland banks and other measures to protect habitat functions and values while accommodating urban growth in the region.” Ecology as well is committed to providing mitigation solutions that make sense ecologically and economically. Wetland mitigation banking is one form of mitigation that can assist in a programmatic approach to mitigation. Ecology has dedicated staff from its wetland mitigation banking program, as well as staff working on the larger regional mitigation program in Clark County, towards ensuring that this proposal meets the intent and need for a regional mitigation approach within the County. Ecology staff have been working in collaboration with Clark County staff to develop the Draft Watershed Characterization of Clark County (Ecology, 2006), which will influence technical decisions made with respect to wetland mitigation bank locations, and service areas, as well as assisting in identifying regional restoration priorities for the region.

This Prospectus combines the efforts of the previously submitted HBNW Prospectus, and portions of the previously proposed Clark County Prospectus. Six sites are initially proposed. In addition to the three previously submitted sites (two from HBNW, one from Clark County), three additional wetland mitigation bank sites are included in the proposal by CCMP. Two of the newly proposed sites are currently privately owned, and the other is a site owned by the Port of Vancouver. CCMP and its partners recognize that a comprehensive wetland mitigation strategy must include sites in a variety of landscape positions to appropriately mitigate for unavoidable wetland impacts. It is therefore the intent and purpose of this proposal to provide mitigation for impacts in greater Clark County by establishing multiple bank sites in a variety of landscape positions and service areas within the region. This strategy is anticipated to ensure appropriate functional replacement when unavoidable wetland impacts are permitted throughout the region. Table 3 summarizes characteristics of sites proposed in this Prospectus.

Table 3: Characteristics of Proposed Wetland Mitigation Banking Sites

Site Name	Site Size (ac)	Acres of Existing Wetlands (ac.) ²	Site Owner/ Proponent	Previously Submitted in 2004 Prospectus?
Vancouver Lake Wetland Mitigation Bank Site	160 acre site	92 acres	Port of Vancouver	No
Mill Creek Tributary Wetland Mitigation Bank Site (formerly “Gabbert”)	29 ac	23 ac	Clark County	Yes
City of Battle Ground Wetland Mitigation Bank Site (formerly “Remy”)	80 ac (60 proposed for bank site)	23 ac	City of Battle ground	Yes
Steigerwald Lake Wetland Mitigation Bank Site	160 ac	18 ac	Privately owned/ proposed by CCMP	Yes
Ridgefield Wetland Mitigation Bank Site	400-500 ac	Unknown	Privately owned/ proposed by CCMP	No
Fargher Lake Bank Site	110 ac	Unknown	Privately owned/ proposed by CCMP	No
Total	1039 ac	TBD		

In total, approximately 1,000 acres of area is proposed to be enhanced and restored as wetland, riparian, and adjacent upland area on six initial sites, thereby contributing to overall regional restoration goals in addition to providing high quality off-site mitigation for unavoidable permitted impacts to wetlands. The exact area of both wetland and upland to be restored³, rehabilitated, enhanced, or otherwise managed will be specified in each Mitigation Bank Instrument (MBI), and will be the basis for credit generation at each site. These lands will be managed in perpetuity as wetland mitigation banks to provide for unavoidable impacts to wetlands within the region. Each site is covered in more detail below.

2.0 WETLAND MITIGATION BANK ESTABLISHMENT PROCESS

Wetland mitigation banking is a relatively new regulatory process in Washington State, though it has been in practice nationally since the early 1990’s. In 1995 Federal Guidance on the establishment, use and operation of wetland mitigation banks was issued by the federal agencies with regulatory authority over wetland permitting (Federal Guidance, 1995). In Washington State, RCW 90.84 was promulgated in 1998 and lead to the creation of a Draft Rule on Wetland Mitigation Banking (WAC 173-700) in 2001. This Prospectus is intended to comply with all levels of regulatory guidance on wetland mitigation banking, including Clark County Code, Washington’s Draft rule, the 1995 federal guidance, as well as consideration of the proposed federal guidance on wetland mitigation banks.

Wetland mitigation banking theoretically offers advantages over traditional compensatory mitigation in several respects. Existing degraded wetland areas are restored or enhanced generating ecological functional lift at a bank site for the express purpose of providing mitigation prior to permitted wetland impacts. The functional lift, in addition to the acreage of wetland area and the type of management action (wetland restoration, creation, enhancement, etc.), is the basis for credit generation. Bank sites are selected based on a variety of factors, including ecological sustainability of the site. Therefore site design

² All wetland acreages are estimates until wetland delineations have been completed and verified by agencies with regulatory authority.

³ The term ‘restoration’ is used very generally in this document, and could include wetland re-establishment. The exact acreage of wetland restoration, re-establishment, enhancement, or other credit-generating activity will be determined through the Mitigation Bank Instrument process specific to each site.

considerations are driven more by ecological conditions on site, rather than meeting mitigation replacement ratios.

Currently, wetland mitigation credits generated from bank sites are released in Washington State over a ten year timeframe. Credits are not guaranteed. Stringent performance standards based on meeting ecological conditions on site must be met, documented, and reported to regulatory agencies with jurisdiction. If a site meets its performance standards then regulatory agencies document the number of credits available for release. Even when credits are available for release, there is no guarantee that credits will be used. In order for credits to be used, regulatory agencies with jurisdiction must first authorize unavoidable wetland impacts, and then determine that those impacts may be appropriately mitigated for at a bank site. Banking then offers additional flexibility in the regulatory process at the end of the mitigation sequencing process which is typically codified in local, state, and federal wetland regulations.

From an ecological perspective having mitigation in the ground prior to the impact is an advantage in that there should be no temporal loss of wetland function (given that the majority of credits are only released when ecological performance standards are met, and credits are released incrementally over a ten year timeframe). This provides greater certainty to regulatory agencies than the existing compensatory mitigation process. From an economic perspective there are economies of scale in establishing large wetland mitigation sites. From a regulatory and time-management perspective agency staff can track one large wetland mitigation bank site which can be appropriate mitigation for multiple small wetland impacts, saving staff time and creating greater efficiency in the process. Perhaps most importantly the wetland mitigation process creates a strong financial incentive for wetland mitigation to succeed. If a site fails to meet performance standards, no credits will be available.

As previously mentioned, Washington State is in the early stages of the regulatory bank establishment process. Draft rules related to wetland mitigation banking have been in place since 2001, and the agency has permitted three private entrepreneurial banks to date since the draft rules related to wetland mitigation banking were created. In addition to the draft rules, Ecology and the other agencies governing the bank establishment process have developed a template MBI to assist applicants.

From a procedural perspective there are several steps to establishing a wetland mitigation bank. The first is Prospectus submittal. The Prospectus is intended to provide a conceptual overview of the proposal. The second is submittal of the MBI, which is the contract between the agencies and the applicant as to the substantive elements common to all banks. Signature of the MBI constitutes wetland mitigation bank site certification. Based on permitted banks projects to date, it has taken several years to achieve wetland mitigation bank site certification. Once certified, wetland restoration design can begin being implemented. Design is based on achieving ecological performance standards documented in the MBI. The ‘life’ of a bank is tied to credit release, which has been a period of 10 years in the permitted private wetland mitigation banks. After the 10 year operational phase, the land owners will work with the holder of the conservation easement to ensure that the bank is protected in perpetuity.

2.1 ADMINISTRATIVE MANAGEMENT OF BANK PROPOSALS – ADDING MORE SITES

Because permitting wetland mitigation bank sites is a complicated regulatory process which can take several years, there is interest in attempting to permit multiple bank sites at the same time. There are both ecological and economic incentives for permitting multiple wetland mitigation bank sites. Ecologically wetlands provide different functions based on landscape position. No single bank site will be appropriate mitigation for all permitted impacts within a jurisdiction. Economically, permitting multiple bank sites at once is perceived as being more efficient.

The regulatory agencies have been supportive of a multi-site approach for the Clark County region. However, the agencies need the ability to manage a process in a way that meets regulatory intent and is enforceable. An open-ended regulatory process by which the applicant continues to add unlimited sites is not feasible from a regulatory perspective. As a result the MBRT and CCMP and its partners have discussed sideboards to adding additional wetland mitigation bank sites to this proposal. This discussion is expected to evolve through the Mitigation Bank Instrument process. The Department of Ecology has indicated that they would allow additional sites to be added to this proposal within an agreed upon timeframe. Both the Portland District and Seattle District Corps of Engineers have suggested a five year timeframe within which additional sites could be added to this proposal.

CCMP would expect that additional sites would comply with all aspects of the regulatory permitting process, including additional public notice as required. If additional sites have not yet been identified within this five-year timeframe, the opportunity to add additional sites will close and the application will be considered complete as proposed.

2.2 THE MITIGATION BANK REVIEW TEAM (MBRT) IN CLARK COUNTY

Typically the MBRT is composed of federal and state agency representatives. Local governments with permitting authority are also invited to participate. Local governmental jurisdictions within Clark County include the cities of Vancouver, Battle Ground, Camas, Washougal, and Ridgefield, as well as Clark County (**Figure 3**). For the purposes of this proposal the MBRT is composed of representatives from the Seattle and Portland District Corps of Engineers, The Department of Ecology, Clark County and the City of Vancouver. Clark County and the City of Battle Ground are partners with CCMP, as is the Port of Vancouver, who owns the proposed Vancouver Lake Wetland Mitigation Bank site. The Port of Vancouver is under the regulatory jurisdiction of the Portland District Corps of Engineers. Both CCMP and the MBRT have been in contact with all of these jurisdictions, as well as with the Cowlitz Tribe, and will continue to work with them in establishing the proposed mitigation bank sites.

2.3 PROPOSED SERVICE AREAS

The service area is the area in which credits can be considered for use. Historically within Washington State service area considerations have been based on several factors including: 1) the draft WAC 173-700 considerations; 2) ecological considerations as described in the watershed conditions in this report; 3) projected demand for mitigation within the area as summarized in this report related to Clark County's Wetland Inventory and Strategy, and the percentage of wetland area located within Urban Growth Areas.

The Service Area for CCMP LLC's Clark County Mitigation Bank sites will be determined by the MBRT in negotiations. However, based on discussions with the MBRT regarding this proposal since August of 2006, CCMP is proposing three service areas for consideration. Recently the Department of Ecology has developed a Watershed Characterization tool which it has applied to Clark County⁴. The Watershed Characterization identifies units based on driving ecological processes such as geomorphology, sediment transport, topography, and surface water flow. The proposed service areas rely primarily on Ecology's Watershed Characterization of Clark County.

The fundamental premise behind Ecology's Watershed characterization efforts is the idea that landscapes are connected and dynamic, change over time, and are influenced by driving ecological processes, such as geologic or soils formation, climatic conditions, topography, and the flow of water across (and over and under) the landscape over time. As is stated in the introduction to the report: "Scientific studies have

⁴ The methodology for Ecology's watershed characterization is documented in Protecting Aquatic Ecosystems, Ecology publication # 05-06-027, available at <http://www.ecy.wa.gov/pubs/0506027.pdf>

shown that watershed processes interact with landscape features, climate, and each other to produce structure and functions of aquatic ecosystems....” (Ecology, 2006) Understanding how landscapes were formed over time, and how and whether those driving ecological processes that lead to the creation of these landscapes are still functioning, or are degraded (and to what extent), can inform policy decisions related to prioritizing restoration actions, and protecting natural systems. The Watershed Characterization efforts inform a broad understanding of the landscape, which is critical to understanding the significance of regional restoration efforts.

The characterization goes a step further to identify not just the driving ecological processes, but the level of alteration or impairment of these processes. In this way, the characterization can inform wetland protection priorities by identifying specific areas within which ecological processes may still be intact. It is important to note that the Watershed Characterization effort occurs at a coarse scale, and though it can help inform broad policy decisions, it is not intended to be used to evaluate site specific conditions. However, with respect to Clark County, it can inform the wetland mitigation bank service area consideration of the agencies by providing a scientific framework for classifying hydrogeomorphic units. These are broad categories which are grouped together based on considerations of “climate, surficial geology, topography, groundwater and surface flow patterns and morphology in relationship to aquatic resources” (Ecology, 2006). Ecology’s Watershed Characterization attempts to group subbasin drainage units by driving ecological processes, structure, and function, resulting in four broad hydrogeomorphic units. These are discussed in detail in the report and represented graphically in **Figures 4 and 5**. The proposed bank sites are located within three hydrogeomorphic units.

The Mill Creek Tributary Bank Site and the City of Battle Ground Bank Site are located in the terrace unit, so called because it lies upon glacial terrace plains (**Figure 4**). “This unit is dominated by rain, has a westward to southwestern trending groundwater flow pattern, a large delta (now a terrace) formed by glacial floods consisting of gravels, sand, silts and clay and a relatively level to moderately steep topography in the foothills and slopes above the Columbia River. The groundwater flow patterns on the north end of this unit trend north and northeast and separate it from the Lewis River Rain Zone unit” (Ecology, 2006).

The Fargher Lake Wetland Mitigation Bank site is located within the Lewis River Rain Zone unit (**Figure 4**). Ecology defines the proposed service area within the Lewis River Rain Zone as: “...a transition unit between the terrace and rain-on-snow units. It is located in the mid-reaches of the Lewis River and the lower reaches of the East Fork of the Lewis River, and is characterized by rain dominated precipitation, shallow and deep patterns of groundwater flow patterns, glacial till over consolidated formations as well as more permeable alluvial formations (i.e. Troutdale formation) and moderate to steep topography. In particular this unit represents a northward shift in terrace groundwater flow patterns towards the East Fork and away from the westward flow towards the Columbia River. It is also influenced by the surface waters draining out of the rain-on-snow unit to the east into the lower reaches on the East Fork Lewis River.”

The Vancouver Lake Bank Site, Steigerwald Lake Bank Site and Ridgefield Bank Site are all located within the proposed Columbia River floodplain unit. “It is located in a rain zone, has sub-surface water flow patterns which are influenced by groundwater discharge from the adjacent upland units and recharge from the river surface waters, geologic deposits consisting primarily of relatively recent river alluvium (sand and silt), and a riverine floodplain and valley walls formed by fluvial action of the river” (Ecology, 2006). CCMP proposes extending this service area beyond Clark County jurisdictional boundaries to encompass the historic Columbia River Floodplain from Bonneville dam to the estuary mouth, including only the Washington State side of this reach to simplify the initial permitting of the proposal at the state and local level. This proposed service area includes the historic Columbia River Floodplain portions of Skamania, Clark, Cowlitz, Wahkiakum and Pacific Counties, and is based on both ecological and

administrative considerations. The proposed service area would be considered for impacts to freshwater wetlands. CCMP anticipates identifying additional sites within this service area as demand dictates.

A spatial service area needs to be defined. USGS 6th field Hydrologic Unit Code (HUC) boundaries are the basis for the mapping of this area. HUCs represent major watershed delineations (i.e. of the larger tributaries) and thereby establish a consistent hydrologic baseline for mapping purposes. A number of islands fall within the river mainstem, and though these are not defined by HUC boundaries, there are surrogate mapping efforts available. Though ecologically within the same area, the islands are not currently proposed as part of the service area.

Ecologically the proposed historic Columbia River Floodplain relies on the dominant hydrologic influence of the Columbia River mainstem from Bonneville to Astoria. Areas along the floodplain which were historically subject to riverine flow may be valuable sites to restore to wetland area. The historic floodplain is therefore defined by hydrologic influence of the Columbia River, as well as topography (it's the areas of relatively low gradient which could be restored to wetland). In addition, the proposed historic Columbia River Floodplain includes the zone of tidal influence within the tributaries, as these areas are subject to controlling influence of the hydrology of the Columbia River. The proposed Columbia River floodplain service area is shown in **Figure 5**.

3.0 WETLAND MITIGATION BANKING REGULATIONS

The proposed wetland mitigation bank sites were selected after careful examination of their environmental potential for wetland banking. Additionally, all sites must undergo an extensive regulatory permitting process to allow local, state and federal agencies to authorize the establishment and use of a wetland mitigation bank for impacts associated with their respective jurisdiction. Following is a summary of regulatory requirements at the local, state and federal level.

3.1 LOCAL REGULATIONS

Local agencies have jurisdiction for any projects that occur within their boundaries. For this project, the sites are located within the City of Vancouver, City of Battle Ground and unincorporated Clark County. Each agency must issue authorizations allowing the use and construction of the bank sites within their jurisdiction. However, neither Vancouver, Battle Ground, nor Clark County have adopted administrative rules specifying how to establish mitigation banks within their jurisdictions. Clark County, in a recent update of the Wetlands Protection Ordinance, adopted language which allows for the use of wetland mitigation banks, but provides no specifics on how banks can be implemented. A Clark County wetland bank permit is required for each site, in compliance with Clark County Code Chapter 40.450.040.7.a.

CCMP understands the need to complete local, state, and federal permitting and meet regulatory requirements in order for this wetland mitigation bank to function properly. To initiate this, discussion representatives from local governments and non-government organizations were invited to an initial meeting on November 14, 2006, during which CCMP presented the proposal and received feedback from regulators. Application materials to initiate the permitting process with local agencies will be completed throughout the process.

Once accepted by the MBRT this Prospectus will go out to Public Notice to solicit comment. Following that process CCMP will proceed with detailed design to restore and enhance each proposed wetland mitigation bank site. Detailed technical studies will be required to meet permitting requirements for each site. All technical reports will undergo review at the local, state, and federal level.

In addition to the standard permitting process, each local agency has been invited to participate actively in the MBRT, or to remain involved at a less active level through receiving meeting minutes or other relevant correspondence.

3.2 STATE REGULATIONS

The State of Washington is involved with this wetland mitigation banking program both as a regulator (all of the sites must go through standard permitting for NPDES, Hydraulic Permit Approvals through WDFW, SEPA, and SHPO) and as the primary coordinating and approving agency for the wetland mitigation banking program (through Department of Ecology).

3.2.1 Background on Wetland Mitigation Banking Draft Rules

The State Department of Ecology has draft rules, which, if adopted, would govern the wetland mitigation banking process. Ecology is in the process of permitting proposed sites under a pilot program, using the proposed rules as guidance. This proposal is one of several under review as part of the pilot program. As of January 2006, three private entrepreneurial banks had been permitted under Ecology's Pilot Program. Ecology is co-lead with the Corps, which adopted Federal Guidance on the Establishment, Use and Operation of Mitigation Banks in 1995.

Much greater detail on each site will be provided further in the regulatory process, under the Mitigation Bank Instrument, which will provide the framework for implementation of each site as a wetland mitigation bank. In addition Section 5.0 of this document identifies more detailed information related to each site at the Prospectus stage.

3.3 FEDERAL REGULATIONS

The proposal is consistent with the Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (Federal Register, 1995).

Compliance with federal regulations, including but not limited to the Endangered Species Act, the Clean Water Act, Section 10 of the Rivers & Harbors Act, NEPA, National Historic Preservation Act, Section 106, and all other pertinent federal regulations is assumed.

4.0 WATERSHED CONDITIONS

This section of the Prospectus is intended to provide background information to inform the service area consideration of the proposed bank sites. It is helpful technical information on existing conditions within the region, and supplements and informs the information in Ecology's Watershed Characterization study (Ecology, 2006). It is drawn from a technical report, prepared by the Lower Columbia Fish Recovery Board, which was approved by the Clark County Commissioners, and has been widely utilized to establish habitat restoration priorities within the region (LCFRB, 2004). Draft WAC 173-700-311 **Criteria for determining service area**, includes some of the factors that are considered in order to reach a determination of appropriate service area. Such considerations include, but are not limited to, the landscape position of the bank site, and the existing and proposed functions of the bank site(s); the watershed, or eco-region within which the bank is located; ecological sustainability of the proposed bank site; the quality, diversity, and regional significance of the bank site habitats to be provided; consistency with existing plans and regional restoration priorities; and information on baseline conditions within the basins in which the proposed bank sites are located.

The Vancouver Lake Bank site is within the Columbia River Floodplain portion of what Clark County defines as the Lake River basin⁵. The Mill Creek Tributary and City of Battle Ground Wetland Mitigation Bank Sites are located within the Mill Creek basin, a primary tributary to the Salmon Creek basin. LCFRB includes the Steigerwald Lake Bank site in the Bonneville Tributaries, an area which Clark County maps and discusses as the Beacon Rock Watershed. The Ridgefield Wetland Bank site is located near the mouth of Gee Creek, at its confluence with the East Fork Lewis River and the Columbia River. The Fargher Lake Bank site is located within the East Fork Lewis River watershed (**Figure 6**). Clearly, different jurisdictions map watersheds, basins and sub-basins differently. For the purposes of this report, the intent is to provide as much background information as practical to inform regulatory agencies and the public as to the existing conditions at the proposed wetland mitigation bank sites, and within generally agreed upon watershed boundaries. Clark County's Regional Wetland Inventory and Strategy (Clark County, 2005), which includes specific consideration of potential wetland mitigation bank site locations, was also used to inform this section of the Prospectus.

4.1 LAKE RIVER BASIN AND SALMON CREEK WATERSHED

4.1.1 Existing Conditions

Salmon Creek is located within an area designated as the Lake River basin by the Lower Columbia Fish Recovery Board. The Lake River basin includes Salmon, Burnt Bridge, and Whipple Creeks and encompasses all of the City of Vancouver metropolitan area. Salmon and Burnt Bridge Creeks are considered separate watersheds by Clark County. Regardless of watershed nomenclature or mapping, this area includes the most highly urbanized portion of unincorporated Clark County (see **Figure 3**). Many of the problems associated with urbanized basins, such as increased impervious area, high temperature, high dissolved oxygen (DO), high turbidity and sedimentation, lack of off-channel rearing, lack of in-stream structure, lack of woody debris, channelization, lack of floodplain connection, continued loss of wetland and stream habitat, and flashy urban hydrology, are problematic throughout the watershed.

The surficial geology in Clark County is sedimentary material in the headwater areas of the Salmon Creek watershed. Much of the Lake River sub-basin is underlain by alluvium from catastrophic flooding associated with the Columbia River and Lake Missoula during Pleistocene Ice Ages, and from more recent flood deposits. The headwaters of the Lake River watershed begin in the low foothills of the southwest Washington Cascades in Clark County. Lake River drains north from 2,600-acre Vancouver Lake. Major tributaries include the Salmon Creek Basin (the largest of the tributaries encompassing a 91 square mile area), Whipple, Flume, and Burnt Bridge Creeks. The Burnt Bridge Creek basin is almost entirely within the incorporated City of Vancouver. Basin elevations range from near sea level at the mouth to 1,998 feet in the headwaters. Most of the streams within this watershed are low gradient within the flat alluvial plain. Vancouver Lake and Lake River are within the historical Columbia River floodplain and are tidally influenced.

The climate of the area is temperate with cool wet winters and warm dry summers. Temperatures are mild with moist air from the Columbia River and the Pacific Ocean. Precipitation is high with mean annual ranges from 40 inches at Vancouver to a high of 85 inches at the Skamania Fish Hatchery in the Columbia Gorge. Average annual minimum temperature is 43 degrees Fahrenheit and average annual maximum temperature is 63 degrees Fahrenheit.

4.1.2 Land Use

⁵ Clark County uses the terms 'basin' and 'watershed' interchangeably. The definitions section of Clark County Code defines 'basin' as :“basin” means a watershed”. CCCC 40.100.070 **Definitions**.

The upper reaches of Salmon Creek have been impacted by silviculture and rural residential development. Major urban centers include the cities of Vancouver, Camas, Battle Ground, Orchards, Ridgefield, and Salmon Creek. As previously noted, the regional population is expected to increase substantially by 2020. Classification of land ownership is as follows: 89% of the land in the watershed is privately owned, 4% federal, 4% state, and 3% other public. Ridgefield National Wildlife Refuge is located within this watershed. In terms of land cover, 71% of the watershed is non-forest, 19% other-forest, 6% mid-seral, 1% early-seral, and 3% water.

4.1.3 Anadromous Fish Use

Upper Bright Fall Chinook, listed as threatened under ESA in 1999, are presumed to use Salmon Creek into Mill Creek just upstream of its confluence with Salmon Creek. Further use within the Mill Creek sub-basin is unknown but possible. Winter steelhead were listed as threatened under ESA in 1998. They are known to use Mill Creek. Coho, listed as threatened under ESA in 1995, are known to use both Salmon and Mill Creeks. Chum are not known to use the Salmon Creek/Mill Creek sub-basin. Cutthroat trout are not listed under ESA, have known use in Salmon Creek, and presumed use of Mill Creek.

Loss of quantity and quality of tributary habitat is a significant issue that impacts all salmonid species within the entire Lake River basin and within Salmon Creek and its tributaries in particular. Although there are no hatcheries on Salmon Creek, the Skamania Fish Hatchery has released winter steelhead in the basin since the early 1980's. However, there are passage obstructions throughout the basin and sub-basins. Fish passage is naturally blocked in Salmon Creek at River Mile 24.1 by Salmon Falls. It is also possible that a 4-foot drop and waterfalls below Highway 99 may limit fish passage on the lower river. Stream flows in the system are directly related to precipitation, given the low gradient, generally low elevation nature of the watershed. Salmon Creek has a December mean flow of 450 cfs (cubic feet per second) and a mean late summer flow of 25 cfs. Salmon Creek is characterized by highly urbanized flashy flows. This is also true of Burnt Bridge Creek. Also typical of urban watersheds, and characteristic of the Lake River basin and sub-basins, is that many historic stream channels have been diked, floodplains have been filled or otherwise disconnected, and the amount of impervious area throughout the basin has increased dramatically over historic conditions.

Impaired runoff conditions are a concern throughout the Lake River basin. The Integrated Watershed Assessment (IWA) noted that 27 of the 34 sub-watersheds are impaired. Again, this is primarily due to high amounts of impervious area, lack of mature forest cover, and alterations to the natural drainage system, in addition to multiple (high) road densities per square mile (9.7 mi/mi square). 87% of the land cover in the basin is non-forest or other use. This results in a decreased level of infiltration, which in turn results in increased runoff and peak flows, and decreased base flows, which, in turn, are associated with decreased vegetative species richness in urbanized wetland systems. In addition, watershed development and water withdrawals have likely reduced stream flows from historic conditions.

4.1.4 Stream Flows

Mean monthly flows in Salmon Creek fell below 12 cfs in five of the 10 years on record. Observations indicate that Mill Creek was perennial prior to 1960; now it typically dries up by mid-July (Wade 2001, cited in LCFRB 2004). Additional data on-site hydrology will be collected throughout this process to inform restoration design.

Interestingly, an HSPF model has been developed for Salmon Creek and was performed as part of the analysis for the WRIA 27/28 studies. The results of the modeling can be summarized by three major points:

- 1) during summer water lows surface water diversions of 3-5 cfs may take 15-30% of stream flows when the total flow is 15-20 cfs;
- 2) reduced recharge due to impervious surfaces reduces the annual base flow by 12%;
- 3) withdrawal from groundwater wells reduces base flow by an estimated 8%.

As the LCFRB summarizes:

“Water use in this basin is a significant component of watershed hydrology, making up as much as 75% of late summer stream flows. Assuming full hydraulic continuity between groundwater and surface waters, the predicted use in 2020 may exceed late summer flows [in the Salmon Creek basin]” (LCFRB, 2004). This is already the case in the Burnt Bridge Creek basin.

4.1.5 Water Quality

Salmon Creek is on Ecology’s 303(d) list for temperature, turbidity, and fecal coliform (WDOE, 1998 cited in LCFRB, 2004). Salmon Creek and several tributaries regularly exceed state standards for fecal coliform, turbidity, DO, and temperature. Development, septic systems, and agricultural activities contribute to impairments.

4.1.6 Key Salmonid Habitat

Generally, pool habitat was found to be lacking throughout Salmon Creek and its tributaries during stream surveys conducted by the Clark County Conservation District in the late 1980’s (CCCD, cited in LCFRB, 2004). 10-15% of the Salmon Creek stream surface surveyed was found to be pool, while generally less than 10% of stream surface in the tributaries was found to be in pool habitat. As indicated earlier, most of the historically present side-channel habitat of the Salmon Creek tributaries has been diked, drained, ditched, or otherwise disconnected or filled within the floodplain.

The CCCD surveys also indicated that sedimentation and compaction of spawning substrate was a major limiting factor to salmonid survival within the Salmon Creek basin. In the Salmon Creek tributaries, 6 of the 20 habitat units surveyed had over 75% fines. Natural background levels of fines vary, but tend to be closer to 10-12%. As previously noted, in urbanized basins sources of sediment include stormwater runoff, development in riparian zones, stream-adjacent roads and trails, small livestock, and recreation. Over 44 miles of stream-adjacent roads exist in the Lake River basin overall.

As a result of development, woody debris is largely absent within Salmon and Mill Creeks. Salmon Creek is protected by bank hardening for much of its middle reaches. Though the intent of the bank hardening is to protect from erosion, it can also result in exacerbated erosion in adjacent, unprotected reaches. Mill Creek is an area of bank instability primarily attributable to livestock access to the riparian zone and lack of natural riparian vegetation (much of Mill Creek is ditched and courses through agricultural areas). Riparian function is poor. Floodplain function throughout the Salmon Creek system is also poor, given that most of the system has experienced a high loss of floodplain habitat. Salmon Creek is incised and disconnected from its floodplain in many areas, as are its tributaries. GIS mapping indicates that 74% of the riparian areas in the Salmon Creek basin are in poor condition; only 1% are in good condition (mid-to late seral forest) (as cited in LCFRB, 2004).

4.1.7 Wetland Area, Type, and Function within the Salmon Creek Watershed

According to the Clark County Regional Wetland Inventory and Strategy, 85% of the land area within the Battle Ground Urban Growth Area (UGA) is potentially wetland (Clark County, 2005). As a result, there is a high likelihood that wetlands within the UGA have the potential to be impacted by growth.

As the inventory notes, the wetland functions vary by landscape position. Generally, riverine wetlands are associated with the lower gradient portions of the watershed, both along the mainstem and within the tributaries. East of Battle Ground is dominated by slope wetlands transitioning to depressional wetlands at the break in the slope at the base of the Cascade foothills. West of Battle Ground depressional wetlands, such as those located both at the City of Battle Ground Bank site, and the Mill Creek Tributary Wetland Mitigation Bank site, dominate. As noted above, the Mill Creek Tributary Wetland Mitigation Bank site also contains some slope wetlands. These depressional wetland areas are valuable for groundwater recharge. In addition, where they are located along tributaries and can be reconnected to former floodplains (relevant for both sites), restoring these wetlands can also contribute to baseflow support and hydrologic connectivity within the system, which is noted in the LCFRB report as a high priority management action. Additionally, restoring and enhancing these systems at the bank site locations will provide substantial water quality, hydrologic, and habitat functions. These are the functions that are targeted for restoration and enhancement at these sites, as noted in Section 5.0.

The proposed Vancouver Lake Bank Site is located within the Vancouver Lake/Lake River basin. Wetlands in this region tend to be low-gradient depressional wetlands in former floodplain (or active floodplain) and ‘provide the full range of water quality, hydrologic, and habitat functions’ (Clark County, 2005).

The proposed Vancouver Lake Bank site is contiguous with land managed by WDFW and USFWS. As a result, restoring and enhancing 160 acres of area will contribute to existing high quality habitat by improving structure and function, as well as adding to connected habitat area in the region. Draft WAC 173-700-300 notes that “The Department shall encourage, with better credit conversion rates, banks that include restoration of wetland systems and banks that provide significant habitat value because they provide connections or corridors to other natural areas.” The Vancouver Lake Bank site meets the connectivity criterion.

4.2 BEACON ROCK WATERSHED

4.2.1 Existing Conditions

The Steigerwald Lake Bank site and the Steigerwald National Wildlife Refuge are within a basin described by the Lower Columbia Fish Recovery Board as the Bonneville Tributaries and referred to by Clark County as the Beacon Rock watershed (**Figure 7**). The Steigerwald Lake Wetland Mitigation Bank Site is within the proposed historic Columbia River Floodplain service area. Streams in this area originate on the steep valley walls of the Columbia River Gorge and flow south through Columbia River floodplain terraces before entering the Columbia River. The floodplain portion of these terraces is included in the proposed historic Columbia River Floodplain service area. Most of the stream lengths are high gradient and spawning habitat is only available in the lowest reaches. The major streams (from east to west) are Gibbons, Lawton, Duncan, Woodward, Hardy, and Hamilton Creeks. Hamilton Creek, located in Skamania County, has the longest channel length at over 8 miles. Figure 7 provides more detail on this area than other watershed maps which tend to combine this sub-watershed with adjacent watersheds. Anthropogenic disturbances to these systems are largely related to the transportation corridors that parallel the Columbia River (State Highway 14 parallels the river in this section, as does the Burlington Northern Santa Fe Railroad, as can be seen in **Figure 12**).

Gibbons Creek is located on the Steigerwald National Wildlife Refuge. Lawton Creek forms the eastern boundary of the property on which the proposed Steigerwald Lake Wetland Mitigation Bank site is located, though the bank site is not expected to extend all the way to Lawton Creek. There is a partial diversion of Lawton Creek onto the site. The diversion is authorized under an existing water right.

4.2.2 Land Use

The basins within the Beacon Rock watershed are mostly forested, with a higher degree of residential and agricultural development in the western portion of the basin, especially in the vicinity of the town of Washougal. The eastern portion of the basin lies within the Columbia River Gorge National Scenic Area, where land use development is limited. The National Scenic Area begins at Steigerwald National Wildlife Refuge and includes the Steigerwald Lake Wetland Mitigation Bank site, though the property owner's existing uses are not restricted by this designation. Land ownership within the basin is 73% private, 23% state, and 4% federal. Land cover is 44% other forest, 29% mid-seral forest, 20% non-forest, 5% early seral forest, and 2% water.

4.2.3 Anadromous Fish Use

Distribution, life history, diversity, abundance, productivity and persistence, hatchery origins, and harvest for all salmonid stocks in the Beacon Rock watershed, and extending into Skamania County as the Bonneville Tributaries, are described in detail in the Lower Columbia Fish Recovery Board (LCFRB) Technical Reports on the subject (Volume II, 2004). To summarize, by stock, Bright Fall Chinook (*Oncorhynchus tshawytscha*), listed as threatened under ESA in 1999, are known to use Gibbons Creek, and presumed to use Watson Creek, a tributary to Lawton Creek. Coho (*O. kisutch*), listed as a threatened species under ESA, are known to use both Gibbons and Lawton Creeks. Chum (*O. keta*), listed as threatened under ESA in 1999, are known to use Gibbons Creek and presumed to use Lawton Creek. Winter steelhead (*O. mykiss*), listed as threatened under ESA in 1998, are known to use both Gibbons and Lawton Creeks. Bull trout are listed as threatened for the Columbia River.

Although the LCFRB report makes no specific notations regarding Lawton Creek, Gibbons Creek is specifically called out, given the history of land use change affecting the site over the last 40 years. According to the LCFRB report, the wetland complex on Gibbons Creek was modified in 1966 and resulted in fish passage problems. Fish passage restoration efforts completed in 1992 created an elevated artificial channel with a fish ladder structure at the mouth. Observations made by Wade (2001, cited in LCFRB 2004) suggest that there may be continued fish passage problems associated with both the mouth at low flows and the elevated artificial channel at high flows. Apparently, bedload buildup during storm flows restricts overflow through a screened intake that feeds the wetlands, overwhelming the diversion channel and spilling fish into adjacent fields, where they become stranded. This is noted here because it appears there may be an existing fish stranding situation in wetlands that may be contiguous to the proposed mitigation bank site. Restoration design at the bank site will take these factors into consideration. It is also likely that the USFWS will be studying this problem in detail as a part of their proposed comprehensive management plan of the NWR, currently under development.

4.2.4 Stream Flows

The Bonneville Tributary basins have not had substantial impacts to hydrologic regimes as much of the area is steep and is now protected by the Columbia River National Scenic Area legislation. No permanent stream flow gauges exist in the basin, and therefore, little information exists on stream flow conditions. The stream flows follow the same general pattern as precipitation due to a lack of storage in the form of impoundment or permanent snowpacks.

Sixty percent of the land cover in the Gibbons and Lawton Creek sub-basins is either non-forest (i.e. urban or agriculture) or other (cleared, scrub) cover. Land cover conditions combined with moderate to high road densities (> 2 mile/square mile) increase the risk of elevated peak flows and reduced base flows.

Study results from an in-stream flow study suggest that for all streams, the flows are well below optimal for both salmon and steelhead spawning and rearing from the first part of September to November (Caldwell, 1999, cited in LCFRB, 2004). Summer low flow problems have also been observed at the mouth of several streams and may possibly restrict fish passage and strand juvenile fish (Wade, 2001 cited in LCFRB, 2004).

4.2.5 Water Quality

Gibbons Creek is listed on the state 303(d) list for violation of fecal coliform standards. Fecal coliforms are believed to originate from failing septic systems and small livestock operations. The greatest proportion of the fecal coliform load comes from Campen Creek, a tributary to Gibbons Creek (Post, R. 2000, cited in LCFRB, 2004). Temperature monitoring in the Gibbons Creek basin in the late 1990's showed regular exceedances of the state standard (64 degrees Fahrenheit; 18 degrees Celsius) in lower Gibbons Creek. Water quality data for Lawton Creek is lacking.

The USFWS conducted BIBI measures at four sites on Gibbons Creek and Campen Creek in the 1990's. Although poor riffle and pool habitat were found along Campen Creek by the golf course, fair to excellent riffle and pool habitat was found elsewhere (Wade 2001, cited in LCFRB, 2004).

4.2.6 Key Salmonid Habitat

State Highway 14 and the Burlington Northern Santa Fe Railroad impact channel morphologies in the lower reaches of Bonneville Tributary streams. These transportation corridors, in combination with agricultural use of the Steigerwald Lake Wetland Mitigation Bank site, limit existing side-channel habitat and riparian floodplain connectivity within the project area.

4.2.7 Wetland Area, Type, and Function within the Beacon Rock Watershed and surrounding area⁶

While only 20% of the Washougal UGA is potentially wetland, the highest function anticipated to be impacted within the UGA is noted as the wildlife corridor/habitat function (Clark County, 2005). The Clark County Regional Wetland Inventory and Strategy notes that most of the wetlands anticipated to be impacted are: "primarily slope and riverine wetlands associated with the Washougal River and its tributaries." (Clark County, 2005. page 4-24). While the association with the Washougal River is certainly present, the influence of the Columbia River is of greater significance to the proposed Steigerwald Lake Bank site. Historically, this site was likely a dynamic riverine wetland system. Steigerwald Lake was historically present, but the historic influence of riverine versus lacustrine processes on the wetland area is unknown. Today it is behind a dike and the hydrology of Steigerwald Lake is controlled via a water control structure on the adjacent National Wildlife Refuge. Despite its landscape position, this site functions more as a closed depressional system than the riverine flow-through system that it may have been historically. However, given the local and regional significance of retaining

⁶ The Beacon Rock watershed extends east into Skamania County. The information drawn from the Clark County Regional Wetland Inventory and Strategy is related to the Washougal area, all of which is located within Clark County (Clark County, 2005). These two areas do not coincide precisely, though there is some overlap. The information is still helpful background on the condition of wetlands within the area, is the best available information, and is therefore included here.

connectivity and adjacency to existing habitat corridors, restoring the Steigerwald Lake Wetland Mitigation Bank site can significantly improve existing wetland structure and function on-site, as detailed in Section 5.0, and is therefore a valuable proposal. In addition, in that it is contiguous with Steigerwald National Wildlife Refuge, the Columbia River, and a steep, forested slope to the north, it meets the criteria identified in WAC 173-700-300 of “provide{ing} significant habitat value because they [proposed bank sites] provide connections or corridors to other natural areas.”⁷

4.3 EAST FORK LEWIS RIVER WATERSHED

4.3.1 Existing Conditions

As noted above, this section is included to provide background technical information, which is pertinent to both the Ridgefield Wetland Mitigation Bank site, as well as the Fargher Lake Wetland Mitigation Bank site. Clark County maps the Ridgefield Wetland Mitigation Bank within the Gee Creek sub-basin, while the Fargher Lake Wetland Mitigation Bank site is located in the East Fork Lewis River as mapped by Clark County (**Figure 6**). However, these sites are located in two separate proposed service areas: the Ridgefield Wetland Mitigation Bank site is located within the proposed Columbia River Floodplain service area as described by Ecology’s Draft Watershed Characterization for Clark County (December 2006, **Figure 4**). The Fargher Lake Wetland Mitigation Bank site is located to the north of the City of Battle Ground, northeast of Yacolt, in the proposed Lewis River Rain Zone service area (**Figure 4**).

The headwaters of the East Fork of the Lewis River are located in Skamania County. The East Fork flows generally west towards its confluence with the North Fork Lewis at approximately River Mile 3.5, roughly 4,000 feet downstream of the I-5 bridge crossing. Most of the East Fork Lewis River watershed, which encompasses 150,635 acres (235 square miles), is located within Clark County. The source of the East Fork is located near Green Lookout Mountain within the Gifford Pinchot National Forest. Elevations within the watershed range from near sea level to 4,442 feet. The headwaters are generally very steep, narrow valleys dominated by bedrock and boulder substrates. Copper Creek and Rock Creek are the two largest tributaries to the East Fork. The stream gradient drops dramatically at River Mile 14 into a broad alluvial valley. Historically, this valley is believed to have been dominated by a multiple age-class forest of willow, alder, ash, and cottonwood along a highly complex, braided meandering channel between approximately River Mile 6 and 10. The Columbia River backwater effects extend to River Mile 6. The hydrologic influence of the Columbia River, including tidal influence, topography (and alluvial soils), is the break for the proposed Columbia River Floodplain service area. Because the upper portion of the watershed developed under volcanic, glacial, and erosional processes, there is a relatively high potential for surface erosion throughout the basin.

The climate in the basin is mild with wet winters and warm dry summers. Mean annual precipitation is 52 inches at Battle Ground. Precipitation in the upper basin is much greater, and a significant portion of the basin is located within the rain-on-snow zone. As a result, the basin is subject to winter freshets and flooding.

4.3.2 Land Use

Most of the basin is forested and a good percentage of the upper basin is managed commercial forest, both on state and federal lands. Agriculture and residential use dominate the valley. The population in the basin was 24,400 in 2000. In terms of land ownership, 63% of the basin is privately owned, 20% is federal, 16% is state, and 1% is in other public ownership. Commercial logging, and fire and flooding in

⁷ Connectivity is greater for passerine bird species and waterfowl than for terrestrial species. The railroad and state highway 14 to the north of the site are hazardous for terrestrial wildlife species and therefore affect the value of the connectivity for these species.

the early 20th century have had severe impacts on basin hydrology, soil conditions, sediment transport, and riparian conditions within the basin. The land cover breakdown is as follows: 37% other forest; 28% mid-seral forest, 25% non-forest, 7% late-seral forest, and 3% early seral forest.

4.3.3 Anadromous Fish Use

Fall Chinook, listed as threatened under ESA in 1999, are known to use the East Fork nearly to the confluence with Yacolt Creek. Coho, listed as a candidate species under ESA in 1995, are known to use the East Fork and its tributaries nearly up to Basket Creek. Chum, listed as threatened under ESA in 1999 are presumed to use the East Fork up to its confluence with Yacolt Creek. Known use of the East Fork occurs to just below the confluence with Rock Creek. Chum spawning areas occur in the lower reaches of the mainstem of the East Fork. Summer steelhead, listed as threatened under ESA in 1998, are known to use almost the entire basin, with the exception of the high gradient upper tributary areas. Summer steelhead spawn both in the mainstem of the East Fork and throughout many of its tributaries. Winter Steelhead, listed as threatened under ESA in 1998, also are known to use nearly the entire basin and spawn in the mainstem and tributaries. The loss of the quantity and quality of habitat throughout the basin is a significant factor in the decline of all salmonid species.

4.3.4 Stream Flow

The greatest land use impacts occur in the lower basin valley floor and are attributable to agricultural and residential development. 18 of the 36 subwatersheds are impaired with respect to landscape conditions that influence runoff: 14 are ‘moderately impaired’ and 4 are functional (these are in the upper headwater tributaries). Based on future population predictions, total water use is estimated to increase from 10% to 20% of late summer flow by the year 2020.

4.3.5 Water Quality

The mainstem of the East Fork from the mouth to River Mile 24.6 was listed on Ecology’s 303(d) list due to exceedances of temperature and fecal coliform standards. Temperatures commonly exceed 64 degrees Fahrenheit (18 degrees Celsius) and occasionally exceed 73.4 degrees Fahrenheit (23 degrees Celsius). Turbidity is also a problem in the valley bottom area.

4.3.6 Key Salmonid Habitat

Generally, there is a lack of adequate pool abundance and quality, particularly in the mainstem. Historically, available side channels and off-channel rearing habitat has been greatly reduced by draining wetlands for agricultural use and conversion to single-channel threads as part of channel confinement projects.

The sediments and substrates of the basin have been heavily influenced by the presence of stream-adjacent gravel mining operations. The mainstem of the East Fork has avulsed into abandoned gravel mine pits several times over the last decade (between River Miles 7 and 10). This occurred in November of 1996 when the mainstem abandoned its channel and avulsed into the former gravel mine pits. As a result, 3,200 lineal feet of riffle habitat was lost and replaced by pools, which rapidly filled with sediment. Such avulsions alter the rate of sediment generation and accumulation. The Integrated Watershed Analysis (IWA) utilized by the Lower Columbia Fish Recovery Board rated 28 of the 36 subwatersheds as moderately impaired with respect to sediment supply and conditions. The rest of the subwatersheds are functional. Sediment supply is limited overall in the watershed because of early 20th century fires following logging, the lack of supply of gravels, and the lack of large woody debris throughout the basin.

Channel stability is a major concern, especially along the lower 14 miles of the mainstem, which is associated with on-going agricultural practices, residential use, and gravel mining. There is a high rate of fines and erosion within this reach, and a low rate of gravel recruitment and distribution.

Riparian functions are degraded as a result of land use practices in the 20th century. Vegetation in the valley floor along the riparian zone is widely dispersed stands of cottonwood, willow, and ash with abundant reed canary grass, Himalayan blackberry, and Scot's broom in disturbed areas. The lower reaches of the basin have been the focus of substantial restoration and replanting efforts in recent years (Wade, 2001 cited in LCFRB, 2004).

Historically, most of the lower reaches of the river were wetlands with extensive braiding, meandering channels. Much of this habitat was altered by 1937 for agricultural purposes. It is estimated that approximately 50% of the historic wetland area had been altered by 1937 by ditching, diking, filling, and draining practices.

More than 75% of the areas zoned for development remain vacant in this basin. These undeveloped lands are likely to convert to other uses over the next 20 years as a result of growth in the area. This is particularly true in the lower portion of the watershed. It is also likely that this growth will lead to an increase in total impervious area within the subwatersheds, increasingly flashy hydrographs and lower summer base-flows and flow conditions due to loss of riparian cover and depletion of groundwater resources. The upper portions of the watershed are likely to remain in long-term commercial forest.

4.3.7 Wetland Area, Type, and Function within the Ridgefield Area

The East Fork Lewis watershed extends to a very broad area. The wetlands in and around the City of Ridgefield (and within its UGA) are located in a variety of sub-basins, including Gee Creek, Allen Canyon Creek, and Flume Creek. All of these wetlands contain slope wetlands feeding in to riverine wetland systems. The Clark County Wetland Inventory and Strategy notes that 85% of the area within the Ridgefield UGA is potentially wetland. Significantly, much of the area in the headwaters of Gee and Allen Canyon Creeks is zoned for future commercial and industrial uses. These uses are likely to impact headwater wetland areas and functions by increasing impervious surface area, and contributing to flashy hydrographic flows typical of urbanizing areas (as noted above). The changes in hydrology affect wetland vegetation, structure, and function throughout the system in a cascading effect. Shallow groundwater recharge is likely to be negatively affected by impacts to headwater wetlands, as are water quality functions, including, but not limited to filtration.

The proposed Ridgefield Wetland Mitigation Bank site can significantly contribute to improving habitat and water quality wetland functions on-site, and also contributes to connectivity to adjacent habitats. While the Ridgefield Wetland Mitigation Bank site also occupies a riverine landscape position, because of land use practices over the last hundred years, it functions more like a closed depressional wetland system than a dynamic riverine system. The bank site is in the Columbia River lowlands and its functions should be seen within that ecological context, as well as within the smaller basins described above. In addition, it should be noted here that the proposed Ridgefield Wetland Mitigation Bank site is within the proposed historic Columbia River Floodplain service area, while impacts to the wetlands located in the headwaters of the Ridgefield UGA are located within the proposed 'Terrace Unit' service area.

The Clark County Regional Wetland Inventory and Strategy did not analyze the East Fork Lewis river watershed.

All of the information provided above is intended to satisfy the suggested regulatory considerations of Draft WAC 173-700-222 Purpose of the Prospectus.

5.0 SITE CONSIDERATIONS

5.1 VANCOUVER LAKE WETLAND MITIGATION BANK SITE

5.1.1 Existing Conditions

The proposed Vancouver Lake Wetland Mitigation Bank site is located within the Columbia River floodplain on property owned by the Port of Vancouver (POV) (**Figure 8**). It is located within the proposed historic Columbia River Floodplain service area. The site is within what Clark County describes as the Lake River basin (**Figure 6**), and is at least partially hydrologically connected to Vancouver Lake. Prior to shoreline armoring along the Columbia River, hydrology on-site was historically likely a combination of riverine flow-through and lacustrine influence from Vancouver Lake. The site now more closely functions as a combination of lacustrine and closed depressional system, though there is likely a complex inter-relationship between riverine hydrology associated with the Columbia River, tidal influence via the flushing channel, and the lacustrine influence of Vancouver Lake, which is immediately to the north of the proposed Vancouver Lake Bank site⁸. The site is approximately 160 acres in size. Approximately 92 acres of the site is existing wetland. A wetland delineation report was completed by the JD White Co. in 2006. A Corps of Engineers jurisdictional determination of the delineation is pending. The wetland delineation report will be provided with the Mitigation Bank Instrument. The area of the subject site has been used for cattle grazing throughout the 20th century. The subject wetland area is described as follows:

“...Category II complex wetland system....Most of the wetland is emergent, with scattered scrub-shrub patches in the center of the site, along the northern toe of the fill slope of SR 501, and areas in the northwest corner....Forested wetland areas dominate the northwest corner of the...area and continue off site to the west and northwest. Irregularly shaped knolls and islands are scattered throughout the wetland. Generally the topography of the wetland is extremely flat with broad, subtle depressional areas. Except along the eastern edge where there is a clear topographic break, and around the perimeter of upland knolls located in the northwest corner of the study area, the topographic slope break at the wetland edge is very gradual. Two slightly deeper depressional areas that pond water late into the summer are contained within the ... [wetland] complex. One area is located southwest of the farm buildings, and the other area is located at the north end of the study area, west of the toe of the cultivated eastern terrace. In the spring, the wetland becomes saturated and inundated from direct precipitation, flooding from Vancouver Lake, and runoff from Lower River Road. Because of the very gradual slope around much of the wetland, vegetation along the wetland boundaries is an ill-defined transitional mixture of upland and hydrophytic vegetation. The wetland boundary was determined by a predominance of upland vegetation, a break in topography at the wetland/upland boundary, and an absence of wetland hydrology indicators.” (Page 7 JDW, 2005).

⁸ Hydrology and hydraulics, specifically Vancouver Lake's water level, are strongly influenced by the Columbia River. Historically, the lake was highly connected to the Columbia River via a series of sloughs along the south and western shorelines, as well as Lake River. Currently, both seasonally high flows in the Columbia River and tidal fluctuations affect the water level of the lake via Lake River and the flushing channel. The flushing channel was constructed in 1981 and first opened in 1982 in an attempt to raise the water surface elevation of the lake and flush water out to the north via Lake River, thereby reducing the turnover time of nutrients and algae in the system. Construction of the channel was an element in a collaborative lake restoration effort led by the Port of Vancouver.

The wetland area is currently an open pasture area. The upland is dominated by non-native pasture grasses. The wetland area is described above. There is a significant tansy ragwort infestation on the site. An active heron rookery is located on the northern portion of the site. The heron rookery extends off-site onto the Shilapoo Wildlife Refuge, managed by WDFW. The rookery is being monitored for heron activity. This monitoring will continue through bank site establishment. Care will be taken during the proposed wetland enhancement to protect existing high quality habitat on-site, including the rookery.

5.1.2 Site Selection Rationale

There are several factors which, when considered together, create a strong case to establish a wetland mitigation bank at the proposed Vancouver Lake site. First, the site is existing wetland, though it has been fairly heavily degraded by cattle grazing throughout the 20th century. As a result of the grazing, vegetation on the site is a mix of pasture grasses with scattered scrub-shrub in some locations, and a few pockets of forested wetland/upland. While from a banking perspective a site that could be fully restored to wetland is preferred, a site that is existing degraded wetland creates an opportunity to utilize existing hydrology, and to re-establish vegetation structure and function within the wetland, while complementing existing wetland functions. Because the wetland hydrology is existing there is less concern as to successful vegetation establishment over time (at least due to hydrologic conditions). Existing hydrology also lessens the concern regarding long-term site sustainability. In addition, the site is adjacent to public lands managed for waterfowl habitat to the northwest, and the north. In total approximately 12,000 acres of land in the Vancouver Lake area are managed for habitat value, and the proposed bank site is connected in a continuous corridor to this area. Restoring wetland and adjacent upland vegetation in a complex mix to create habitat structure and interspersed will increase the existing functions on site. In addition, not just the wetland, but significant buffer area can be established by upland scrub-shrub and tree plantings within the site, and for portions of the site to the east, north, and northwest. In this way the site can be protected from impacts of adjacent land uses over time. This will not be possible for the entire site, as the wetland area is contiguous to a road to the south, but the site total size is 160 acres, 92 of which is wetland. It is CCMP's intent to manage the entire 160 acre area, including upland buffer planting and maintenance to protect existing and projected wetland functions over time. In addition, the Port of Vancouver has set aside area on the adjacent parcel 7 to function as upland buffer to the proposed wetland mitigation bank site.

5.1.3 Clark County Regional Wetland Inventory and Strategy

The Clark County Wetland Inventory looks at a variety of factors in identifying potential wetland mitigation bank locations. One of the factors that was considered was the percentage of a watershed within an Urban Growth Area (UGA), and overlain on that consideration the percentage of area within the watershed that is potentially wetland (according to mapping). If a watershed has a high percentage of wetland area within a UGA, then that watershed could be considered to have a high likelihood of potential wetland impacts, and therefore might be a likely candidate for a proposed wetland mitigation bank site location. The Vancouver Lake/Lake River watershed has 43% of its area within a UGA (i.e. developable) and 31% of that area is potentially wetland (Wetland Inventory, Table 4-2). With respect to the Vancouver Lake/Lake River watershed, the Wetland Inventory noted that a significant part of the land within this area is undeveloped and managed for fish and wildlife habitat by state and federal agencies. Though the report specifically noted the Port of Vancouver, USA's expansion plans, the report concluded that the area was arguably not the highest priority for a wetland mitigation bank site location precisely because of the extent of land already managed for fish and wildlife habitat, especially as compared to other watersheds. It also noted that: "Because the proposed development in this watershed is managed by a single entity [The Port of Vancouver] ...banking opportunities were not critically evaluated in this area." (Clark County, August 2005).

CCMP would argue that establishing a bank contiguous with and adjacent to already protected lands is of value both for the bank and for the adjacent lands managed for habitat. In addition a bank on Port of Vancouver property is the best possible location for required off-site mitigation resulting from Port of Vancouver proposed developments from the Port's perspective. It essentially means that the Port of Vancouver can address its own mitigation needs on its own property, whether that be as compensatory mitigation, a bank site, or a combination of the two.

5.1.4 Conceptual Design Goals

- Increase habitat complexity and interspersed by planting with a mix of native forest, scrub-shrub, and emergent species appropriate to the site
- Increase habitat structure and function by planting with a mix of native forest, scrub-shrub, and emergent species appropriate to the site
- Enhance existing habitat connectivity and structural complexity by revegetating 160 acres of degraded pasture area including 90+ acres of wetland and roughly 70 acres of adjacent upland area to a native forested scrub-shrub wetland complex contiguous with lands currently managed for habitat value
- Increase plant species richness and diversity
- Utilize reference site (to the north) for appropriate planting types
- Control Reed Canary Grass and Tansy Ragwort and other invasive/noxious weeds
- Maintain and enhance the waterfowl and other high quality habitat and existing open water areas of the site

5.1.5 Existing Easements:

- A BPA Easement bisects the property in a roughly east-west direction. The area encumbered by the easement is not creditable in the wetland mitigation banking proposal.

5.1.6 Adjacent Land Use

The Port of Vancouver has created an Economic Development and Conservation Plan to guide its planned expansion. Included in this plan is a rezone of parcel 7 (50 acres) adjacent to the bank site (which the Port calls 'parcel 6'), from agricultural to light industrial use. The Port of Vancouver does not foresee an immediate use for parcel 7 but does anticipate further economic expansion in the future.

Parcel 8 (58 acres) which is also adjacent to and east of the bank site (the existing house and farm buildings are currently located at this site), has been included in the Port's Economic Development and Conservation Plan but has followed an accelerated development plan. Parcel 8 is zoned for light industrial development. The site plan includes buffers that separate parcel 8 and the wetland mitigation bank as well as the construction of a foot path and lookout point.⁹

The Port's proposed Columbia Gateway development includes a new marine terminal at Parcel 3 (across Lower River Road to the west along Columbia River shoreline) and mitigation / habitat creation at Parcels 4 and 5 (also across Lower River Road, along Columbia River shoreline, west of the proposed bank site). Parcel 3 is located south of the flushing channel, which connects the Columbia River to Vancouver Lake, while Parcels 4 and 5 are located to the north.

In summary, it is anticipated that many of the credits available from the proposed Vancouver Lake Bank site will be utilized by the Port itself. However, because the Vancouver Lake Bank site is within the proposed Columbia River Floodplain service area, credits generated from the site may also be utilized to

⁹ This information is taken off of the Port's website at <http://www.portvanusa.com/property/columbiagateway.html>

offset similar developments with permitted unavoidable impacts proposed by one of the 14 Ports along the Lower Columbia River.

5.2 MILL CREEK TRIBUTARY BANK SITE

5.2.1 Existing Conditions

Clark County is proposing to restore and enhance an approximately 29 acre area to establish a wetland mitigation bank in cooperation with CCMP (**Figure 9**). The Mill Creek Tributary Bank site is located in the central northern portion of the Salmon Creek watershed, one of the larger drainages within Clark County. It is located within the proposed Terrace Unit service area as defined by Ecology's Draft Watershed Characterization Study (Ecology, December 2006). See Figure 4.

The site is bounded on the north by NE 199th Street, on the west by 29th Avenue, on the east by private property maintained in mowed grass, and on the south by private property as well, also maintained in mowed grass.

The proposed bank site area contains an ephemeral ditched tributary to Mill Creek, as well as existing degraded emergent and slope wetlands in abandoned agricultural fields. Much of the area has been used for grazing since the 1940's and as a result is dominated by introduced pasture grasses mixed with patches of reed canary grass. The ditch, which contains the tributary to Mill Creek, is bounded on either side by a narrow strip of riparian vegetation (ranging from 0 to 15 feet on either side). The vegetation is predominantly shrub in the northern portion of the ditch (*Salix scouleriana*, *S. geyeriana*, *Spiraea douglasii*) transitioning to some forested cover in the south (*Fraxinus latifolia*, *Populus trichocarpa*). The pasture area which comprises most of the site was likely tiled to drain to the ditch (Gaddis, January 2005). A wetland delineation report was included in Clark County's Prospectus II (Gaddis, January 2005) and will accompany the site specific Mitigation Bank Instrument. The delineation states that there are approximately 23 acres of wetland on the site. The wetland delineation has not received a jurisdictional determination from the Corps to date. Archaeological shovel test probes were completed for the site as well, and a Cultural Resources Survey was completed for the site when it was associated with a capital road project. A Biological Assessment was completed for that same project, and incorporated full review of project impacts related to listed species, and a Biological Opinion was issued by NMFS for that project. However, at the time the BA was written, it addressed impacts associated with wetland enhancement/mitigation work occurring adjacent to this banking project site, not this site itself. This is significant because while a BA has been completed, it did not address the design being proposed for the banking program. However, the majority of the document should be applicable to this process.

5.2.2 Site Selection Rationale

Originally Clark County proposed 46 acres on which to establish a wetland mitigation bank. However, of the 46 acres, approximately 17 acres (formerly called 'north Gabbert') were separated from the existing proposed site by a road intersection which is to be widened (NE 199th Street and NE 29th Avenue; NE 199th is to be widened east to west). For a variety of reasons the 'north Gabbert' site was dropped from consideration as a bank site, leaving the 29 acres to the south, currently called Mill Creek Tributary Bank Site, as the proposed area in which to locate a bank. In their Prospectus Clark County stated that the properties had been purchased in 2002 and 2003 with the intent of creating a mitigation bank to offset County Public Works' projects with unavoidable impacts to wetlands. The site is in a headwater position, which is considered a favorable landscape position in that site restoration and enhancement can significantly improve existing degraded functions on site, such as those related to water quality and quantity, as well as habitat. The water quality and quantity-related functions (such as surface water storage, improved baseflow, sediment trapping, etc.) can help ameliorate downstream conditions within

an urbanizing basin. In addition to ameliorating wetland functions on site, the site contains a ditch and degraded riparian conditions. The riparian zone can be significantly enhanced by taking it out of its deeply incised ditch, and extending the forested corridor and improving in-stream habitat for native cutthroat and potentially coho habitat as well. Improving the riparian habitat would provide benefit throughout the system as it continues offsite to the south. There is an intermittent forested corridor along the stream to its confluence with Mill Creek. Water rights are included in the site should they be required to maintain plantings. Regionally, the Mill Creek sub-watershed has been identified as being “critically deficient in its ability to provide headwater storage and water quality functions. Salmon Creek is a TMDL stream with identified deficiencies in temperature and fecal coliform bacteria. Salmonid habitat resources are severely compromised in the Mill Creek sub-watershed and throughout the County. The Gabbert [now Mill Creek Tributary] site offers the potential to increase these functions.” (Prospectus II, Gaddis, 2005).

5.2.3 Clark County Regional Wetland Inventory and Strategy

The Inventory breaks out the Salmon Creek watershed by ‘upper Salmon Creek’ and ‘lower Salmon Creek’. The upper portion of Salmon Creek and its tributaries are largely within the Battle Ground UGA (85% of the land area within the Battle Ground UGA is potentially wetland). The Mill Creek Tributary Bank site is not within the Battle Ground UGA, nor is it within the City of Vancouver UGA, but the types of functions to be improved at the Mill Creek Tributary bank site will benefit Mill Creek as well as Salmon Creek downstream. The area in which the Mill Creek Tributary is located is addressed within the wetland inventory:

“Riverine wetlands are associated with the lower gradient tributaries of Salmon Creek, as well as with the main stem. East of Battle Ground there are slope wetlands that transition to depressional wetlands at the break in the slope at the base of the Cascade foothills. West of Battle Ground, depressional wetlands dominate. This is a valuable groundwater recharge region for the county. Many of the remaining wetlands in the vicinity are on agricultural land or former agricultural land that is transitioning from other uses.” (Clark County, 2005). Table 4-8 of the Inventory recommends that Wetland Mitigation Bank sites in the Battle Ground UGA target the following functions:

	Function	Physical Characteristic
Water Quality Functions	Filtration/temperature	Gently sloping or depressional with herbaceous vegetation; trees near stream
Hydrologic Functions	Floodplain storage	Depression
Habitat Functions	Corridor and Fish Habitat	Buffer tributaries and creeks

(Clark County, 2005). The Mill Creek Tributary site meets all of these conditions. The following section details preliminary design goals for the site.

5.2.4 Conceptual Design Goals

- Restore hydrology and wetland area on the site by reconnecting the stream channel to its floodplain and wetland area, disabling drainage tiles and excavating as necessary
- Increase baseflow support to the Mill Creek Tributary both by reconnecting wetland/stream floodplain connectivity, and by expanding the wetland area on site
- Decrease peak flows
- Increase nutrient cycling and retention
- Increase groundwater storage and filtration
- Intercept shallow surface water flow and shallow groundwater along NE 29th through a bioswale

- Enhance existing habitat complexity and interspersed of wetland/upland transition zone through a combination of grading, planting with a mix of native forest, scrub-shrub, and emergent species appropriate to the site. (Willows along low elevation shoreline, Oregon ash/cottonwood in floodplain, Oregon white oak in upland patches, transitioning to mixed coniferous/ deciduous woodland on adjacent upland)
- Increase habitat structure and function of the wetland, upland, and riparian area by planting with a mix of native forest, shrub, and emergent species appropriate to the site
- Increase native plant species richness and diversity
- Increase water quality and quantity on-site
- Increase flood protection to downstream property owners
- Control Reed Canary Grass and other invasive species (Himalayan blackberry)
- Confirm, protect and enhance the *Juncus patens* habitat and species on-site

5.2.5 Existing Easements

A 60' natural gas easement (and gas line) crosses the site in the northwest corner adjacent to the intersection of NE 199th Street and NE 29th Avenue. The area within the easement is not creditable for the wetland mitigation banking proposal.

5.2.6 Adjacent Land Use

Clark County is proposing to widen and improve NE 199th Street. The right-of-way corridor will be subtracted from the creditable area on the proposed bank site. 29th Avenue creates the western site boundary. A bioswale will be located in upland area adjacent to 29th Avenue to catch and treat stormwater and road runoff prior to entering the site. Land use to the south and east is rural residential.

If established as a wetland mitigation bank site the Mill Creek Tributary site would provide offsite mitigation for anticipated Clark County Public Works projects within the proposed Terrace Unit service area.

5.3 CITY OF BATTLE GROUND WETLAND BANK SITE

5.3.1 Existing Conditions

The City of Battle Ground owns an approximately 80 acre parcel, approximately 60 acres of which it is seeking to develop as a wetland mitigation bank in cooperation with CCMP (**Figure 10**). The 60 acre subject property contains approximately 23 acres of wetland area (**Figure 11**). The site is located within the proposed 'Terrace Unit' service area. A wetland delineation report and correspondence with agencies regarding the 1999 delineation was submitted as part of HBNW's original Prospectus in 2004. However, based on a site visit conducted with the MBRT on October 27th, 2006, the wetland delineation conducted by Environmental Technology Consultants, Inc. in 1999, and approved by the Seattle District COE in February of 2000, will have to be re-evaluated as a part of the Mitigation Bank Instrument for this site. Current field conditions did not match the delineated wetland boundaries from the 1999 report, and a current evaluation of wetlands on the site will be completed. Despite this, the information provided by the ETC report is a helpful general guide at this stage in the process, and therefore information from that report is included here. The ETC wetland delineation report states that approximately 23 acres of this area is jurisdictional wetland. Of the roughly 23 acres designated as wetland in the ETC delineation, 17.8 acres is categorized as 'Old Field', which the report characterizes as 'the *Alopecurus* association, the *Deschampsia* association, and the *Phalaris-Alopecurus-Juncus* association' (ETC, 1999).

Much of the site was managed for agriculture (cattle grazing and hay production) throughout the 20th century. The northern portion of the site contains the headwaters of Mill Creek, a tributary to Salmon Creek. The creek is ditched in a straight east-westerly direction. Vegetation along the ditch is a combination of spiraea and rosa. Drainage tiles run perpendicular to the creek; the location of the tiles is evident in the wetland delineation map and aerial photographs of the site. Drainage tile location is also indicated on-site by shallow depressions in an otherwise very low gradient (less than 1%) topographic site. The northeastern corner of the site does contain a Category I forested Fraxinus-carex wetland complex. It also contains a quaking aspen stand, rated as a Category I Natural Heritage Wetland. This site was utilized as a reference wetland for the Clark County wetland inventory.

5.3.2 Site Selection Rationale

The City of Battle Ground site is located within the City's UGA. It is very difficult to find sites of this size within an urban growth boundary. In addition the site's habitat value is enhanced by off-site connectivity to existing high quality wetland to the north, and the Mill Creek corridor to the west. The site is currently highly degraded; vegetation is dominated by pasture grasses and there is little habitat structure or interspersed, with very little structural complexity. Floodplain connectivity is impaired by the ditching on site. However, it is likely that by disabling the drainage tiles wetland hydrology can be restored which would sustain wetland vegetation re-establishment on the site. Restoring the site to functioning wetland will improve water quality and water quantity-related functions, as well as habitat functions on site. Floodplain connectivity with Mill Creek would also be restored as part of the overall site restoration design. Located in the headwaters of Mill Creek, the site is in an important landscape position. Ameliorating water quantity and quality degradation in these areas is significant to the Mill Creek and Salmon Creek system further downstream.

5.3.3 Clark County Regional Wetland Inventory and Strategy

Despite the site's favorable landscape position, the performance of all wetland functions is limited by the site's location within an urban growth area. However, given that 85% of the Battle Ground UGA is potentially wetland there will be a need for mitigation within the UGA. The Wetland Inventory called out the upper Salmon Creek watershed as an area of high potential conflict between developable area and potential wetland area. In addition the Inventory identified a number of priority banking opportunity areas. The City of Battle Ground site is located within priority banking area #5, and meets all of the goals for wetland mitigation bank sites within the Battle Ground UGA (including increasing functions related to water quality and quantity, as well as habitat, noted above with respect to the Mill Creek Tributary bank site).

5.3.4 Conceptual Design Goals

- Restore hydrology and wetland area on the site by disabling the drainage tiles and examining the feasibility of relocating Mill Creek in its historic channel
- Reconnect Mill Creek floodplain with wetlands on-site
- Increase baseflow support
- Increase groundwater storage and filtration
- Increase habitat complexity and interspersed of wetland/upland transition zone through a combination of grading, planting with a mix of native forest, scrub-shrub, and emergent species appropriate to the site. The design target is assumed to be the Category I forested Ash wetland complex in the northeast corner. The percentage of the ecologically appropriate mix of ash and quaking aspen forest versus other wetland classes will be based on an analysis of historic extent of habitat type and what the site will currently support.

- Increase habitat structure and function of the wetland, upland, and riparian area by planting with a mix of native forest, shrub, and emergent species appropriate to the site
- Increase habitat connectivity to wetlands offsite to the north, in an urban area
- Increase native plant species richness and diversity
- Increase water quality and quantity on-site
- Increase flood protection to downstream property owners
- Control Reed Canary Grass
- Consider passive recreational trails on the perimeter of the site, sited to avoid wetland and buffer area to the maximum extent practicable
- Incorporate Category I wetland located to northeast of subject property in to bank site proposal to the extent practicable

5.3.5 Adjacent Land Use

The City of Battle Ground acquired the site with the intention of developing it for public access, specifically for ballfields/sports complex. Originally all 80 acres were to be developed, and design details were created which showed the entire wetland area to be filled. However, since 1999 the City has modified its plan to accommodate the proposed ballfields primarily on the southern 20 acre portion of the 80 acre site, which is mostly upland, while the northern 60 acres is to be developed as a wetland mitigation bank. The ballfields proposal is in process, and is a high priority to the City. Indirect impacts resulting from the ballfields to the proposed wetland mitigation bank site will likely include glare from lighting, and noise generated by the use of the ballfields seasonally. Direct wetland and buffer impacts are also anticipated to the wetlands currently located on the southern 20 acre portion of the site. Impacts are more fully addressed through the permitting process for the ballfields, which the City of Battle Ground is pursuing separately from this process.

The site is also bounded to the west by a main north-south arterial. The City plans to widen this arterial; the area to be affected at the proposed bank site is not yet known, but will not be included in potential credit area of the bank site. In addition the City has an adopted 6-year Transportation Improvement Plan which identifies that Rasmussen Boulevard be extended from its present location (off-site to the north and east) to create an east-west thorough-fare that would run off-site to the north of the proposed wetland mitigation bank site. (The City currently owns a 60 foot right-of-way that separates the proposed wetland mitigation bank from the residential development to the north – this would be the area through which Rasmussen Boulevard, if extended, would run). Though this is currently a proposed project, if implemented, it would eliminate the bank's offsite habitat connectivity to the north, to the Natural Heritage Wetland. The proposed extension of Rasmussen Boulevard would impact the Natural Heritage Wetland. This proposal would be permitted separately by the City, and the timeframe or likelihood of the project is speculative at this time, but it is worth noting that the proposal is on the City's Transportation Improvement Plan.

The area to the east of the site is currently undeveloped former agricultural pasture area. It is zoned commercial.

The adjacent developments and land use are typical of development in urban areas where density is high and adjacent land uses rarely offer an opportunity for ecological buffer areas. The possibility of establishing a wetland mitigation bank at this site may offer some protection to adjacent wetland areas off-site to the north, and may even create an incentive for those property owners to consider adding their properties, or portions of their properties, currently zoned commercial, to the bank site as preservation areas. This would considerably enhance the value of the proposed wetland mitigation bank, but given the financial value of commercially zoned land, this is speculative at this time. Conversely, if the adjacent properties are developed it would negatively impact the proposed bank site. In either case there is a need

for wetland mitigation within the UGA, and this site provides an opportunity to establish a wetland mitigation bank site within an urban area, in addition to satisfying the Clark County Regional Wetland Inventory and Strategy criteria identified for wetland bank site locations, and being within an area that the Wetland Inventory identified as a high priority area for siting wetland mitigation banks.

If established as a bank site within the proposed Terrace Unit service area, the City of Battle Ground bank site would be considered for offsite mitigation resulting from road improvement projects in the area (WSDOT anticipates widening state highway 502 from Battle Ground to I-5), City public works and infrastructure improvements in the area, as well as private residential and commercial development within the UGA.

5.4 STEIGERWALD LAKE WETLAND BANK SITE

5.4.1 Existing Conditions

The proposed Steigerwald Lake Wetland Mitigation Bank site is located on approximately 160 acre portion of a privately owned 240 acre parcel contiguous to the eastern boundary of Steigerwald National Wildlife Refuge (NWR) (**Figure 12**). It is located within the proposed Columbia River Floodplain service area. Steigerwald Lake is a former lake and floodplain area that was diked in 1964 to create an industrial park (now the site of the Port of Camas/Washougal). Dredge spoils from the Columbia River were pumped over the dike filling in much of the wetlands. Steigerwald became a designated National Wildlife Refuge in 1984. It contains historic lakebed and river bottomland habitat. The proposed wetland mitigation bank site has been maintained in active agricultural use, including livestock grazing, for decades. The property is currently privately owned, and has been owned by the same family since the 1940's. The property contains the original homestead and outbuildings associated with the farming activities on site, as well as the ranch manager's dwelling. The site is bounded to the west by the NWR, to the south by the Columbia River, to the east by Lawton Creek, and to the north by the Burlington Northern Santa Fe Railroad track and a steep embankment below State Highway 14. As a result of active pasture management over the last century, both on the proposed bank site and on NWR property, little native emergent wetland vegetation exists on the site. The site is open rolling grasslands, dotted with occasional cottonwood trees, none of which are located in wetland areas on-site. The site is also protected by a large dike that is maintained by the Corps of Engineers. Historically the site was likely a combination of lacustrine wetland associated with Steigerwald Lake, and riverine wetland seasonally associated with the Columbia River.

Final contours and size of the Steigerwald Lake Wetland Mitigation Bank will depend on wetland restoration design, but it is anticipated to encompass approximately 160 acres of the western portion of the property. A survey of the property was performed by Ducks Unlimited during the spring and fall of 2005. The survey will be submitted along with detailed site information in the Mitigation Bank Instrument.

Three areas of wetland exist on-site, totaling approximately 18 acres. There is no open water component to the wetlands located on the proposed bank site. A wetland delineation report was prepared by Ecological Land Services, Inc. and submitted to the MBRT in December of 2005. The delineation has not been verified and is therefore considered preliminary. A copy of the wetland delineation report will accompany the MBI. Wetland vegetation on-site is dominated by reed canary grass around the perimeter of Steigerwald Lake.

5.4.2 Site Selection Rationale

The proposed Steigerwald Lake Wetland Mitigation Bank site is connected to significant tracts of habitat off-site to the south (Columbia River), to the west (Steigerwald NWR), to the north (a steep embankment containing native oak, but also bisected by a railroad and State Highway 14) and to the east (Lawton Creek and private property continuing to the Columbia River). The site was likely a combination of riverine and lacustrine wetland from the historic Steigerwald Lake. While it is possible to restore the hydrology to the site, it is not process-based ecological restoration, rather, the current site design would have to rely on a cross-dike on Steigerwald NWR property to back water up onto the proposed wetland mitigation bank site. Though this may not be the preferred solution ecologically, it will result in additional wetland acreage on the site, in a way that can be controlled to maximize wetland area. There is also significant opportunity to enhance the upland and buffer areas on the site, and to greatly increase habitat interspersions over existing conditions. Unlike the sites located within the urban areas, this site will not be subject to many of the degradations which are part of the urban landscape; the contributing basin to this site is fairly small, and upstream uses have a negligible impact on site conditions.

The site is noted as an area of biological significance by the Lower Columbia Estuary Partnership because of its size and the potential to restore the Gibbons Creek channel to natural function and anadromous fish access on the adjacent National Wildlife Refuge (there is currently blockage to fish passage on Gibbons Creek both upstream and downstream on NWR property). Restoring this site by allowing it to be inundated may create additional opportunities for off-site restoration on NWR property; inundating the proposed bank site hasn't been possible in the past because it was incompatible with cattle grazing on the site. As a result, the levels of Steigerwald Lake have been managed by NWR staff to avoid open water areas on the proposed bank site location. Restoring wetland area and hydrology to the proposed bank site via a cross-dike on NWR property may create the opportunity to more fully restore Gibbons Creek as well as the historic levels of Steigerwald Lake. Re-introducing riverine hydrology to the site via a controlled tide-gate under the existing Corps dike is also an option that would more closely mimic the driving riverine processes historically present at the site. Restoring property on the NWR site would be a long-term project that would have to tie in to maintaining the restored wetland area on the proposed wetland mitigation bank site.

If established as a wetland mitigation bank site the site would be located within the proposed Columbia River Floodplain service area. The site is in close proximity to the Port of Camas/Washougal and may be considered appropriate mitigation for Port-related development impacts within the proposed Columbia River Floodplain service area.

5.4.3 Clark County Regional Wetland Inventory and Strategy

The proposed Steigerwald Lake Wetland mitigation bank site is located within the Beacon Rock watershed according to Clark County. This is a sub-watershed of the Washougal River. The proposed site is outside of Washougal's UGA, and therefore the information related to the UGA is not directly relevant to the proposed bank site. Washougal, unlike the Battle Ground area, is not experiencing the same level of growth, though the inventory notes that "establishing a wetland banking site in the Washougal area would be proactive and insightful, in preparation for growth." (Clark County, 2005).

5.4.4 Conceptual Design Goals

- Increase hydrology and wetland area on the site by controlling the water levels of Steigerwald Lake. The control structure is located on the NWR property. NWR refuge staff is aware of and supportive of the restoration design concept

- Increase habitat complexity and interspersed of wetland/upland transition zone through a combination of grading, planting with a mix of native forest, scrub-shrub, and emergent species appropriate to the site.
- Explore the opportunity to restore oak woodlands to the site – DNR owns a Natural Heritage site to the north and east which may be an appropriate reference site if soils appropriate to this community exist on-site. Coordinate with other agencies and interested parties regarding the opportunity to restore other native plant species and/or community types (e.g. Nelson's checker-mallow (*Sidalcea nelsoniana*) and Bradshaw's lomatium (*Lomatium bradshawii*))
- Enhance existing habitat connectivity and structural complexity by revegetating 160 acres of degraded wetland pasture area to a native forested scrub-shrub wetland complex contiguous with Steigerwald NWR to the west and the DNR Natural Heritage Site to the north and east
- Increase native plant species richness and diversity
- Increase water quality and quantity on-site
- Increase groundwater recharge and storage
- Increase flood protection to downstream property owners
- Control Reed Canary Grass

5.4.5 Adjacent Land Use

The site is protected by impacts of adjacent development both by landscape position (it is in the floodplain, but behind a COE dike), adjacent to the Columbia River to the south, a steep embankment that is bisected by a rail line at the base of the slope, and by state highway 14 at mid-slope, and to the Steigerwald National Wildlife Refuge to the south. In addition, the site is located within the National Scenic Columbia Gorge area.

5.5 RIDGEFIELD WETLAND MITIGATION BANK SITE

5.5.1 Existing Conditions

The proposed wetland mitigation bank site is within the East Fork Lewis River watershed, (**Figure 6**), located at the confluence of Gee Creek, the East Fork of the Lewis River, and the Columbia River. It is within the proposed Columbia River Floodplain service area as described in Ecology's Draft Watershed Characterization of Clark County (**Figure 4**, Ecology, 2006). The proposed bank site encompasses a portion of a pre-donation land claim totaling several thousand acres of land (**Figure 13**). Of this property, the portion north of Lancaster Lake, comprising approximately 400 to 500 acres, has been utilized throughout the 20th century through the present time as pasture area for cattle. This pasture area north of Lancaster Lake has been ditched, drained, tiled, and cross-tiled. It is bounded to the north by the East Fork of the Lewis River. Hydrologic influence from the East Fork of the Lewis River on the subject area is estimated to be minimal as the northern property line is a dike road (except during extreme flooding events). The north bank of the property is armored along the dike with rip rap. Lancaster Lake is also artificially impounded with a road and sub-road culvert on its southern boundary (indicated as 'The Narrows Dam' on the Clark County wetland inventory maps). The eastern boundary of this area is the BNRR line, which crosses the property north to south. The southern extent of the property includes the mouth of Gee Creek to its confluence with the East Fork Lewis and Columbia River. Ridgefield National Wildlife Refuge is contiguous to the property to the south. It is likely that the area under consideration for a wetland mitigation bank site was historically a complex mosaic of riverine and possibly lacustrine wetland area associated with the lowland forest, which likely covered much of the area prior to European settlement. Existing wetland area is currently unknown, as no wetland delineation has been performed. The Clark County wetland inventory indicates that the area surrounding Lancaster Lake is wetland up to the East Fork of the Lewis River. The wetland area is bounded to the west by a basalt formation. Restoring this property offers a spectacular opportunity to create a continuous habitat corridor managed

specifically for habitat structure and function between Ridgefield National Wildlife Refuge and the East Fork of the Lewis River. Of the sites proposed in this Prospectus, this site has the least amount of technical documentation from CCMP to date. As a result, this site may be developed after some of the initial sites in this Prospectus. Detailed technical reports will accompany the site specific MBI.

5.5.2 Site Selection Rationale

The proposed bank site is surrounded by land currently used for agriculture (cattle grazing on site) and forestry (on-site to the west, and upslope to the east). Lancaster Lake and its associated wetlands lie to the south, and further south Gee Creek winds its way to its confluence with the Columbia and Lewis Rivers. South of Gee Creek is the Ridgefield National Wildlife Refuge. North of the dike road is the East Fork of the Lewis River. The proposed bank site location is bounded to the east by the railroad, though the property continues to the east, and includes Mud Lake (this is not part of the proposed wetland mitigation bank site, though it is under the same property ownership). Restoring wetland hydrology to the pasture area in the Columbia River lowlands offers an opportunity to restore and/or enhance a fairly significant area within the Columbia River Floodplain from degraded pasture to wetland function. There is an opportunity for a remarkable degree of habitat connectivity between the National Wildlife Refuge to the south, the proposed bank site, the East Fork of the Lewis River, the agricultural fields on the north bank of the East Fork of the Lewis, and the Columbia River to the west. Sauvie Island lies to the west in the middle of the Columbia, bounded on the east by the Columbia River, and the west by the Multnomah Channel; Scappoose Bay lies further to the west on the Oregon side of the river. Saint Helens Oregon is the closest incorporated town across the Columbia to the west. **(Figure 14)** The site was historically likely a complex and dynamic riverine wetland system associated with Lake River, the East Fork Lewis River, and the Columbia River. Hydrologic processes have been altered by the presence of Bonneville Dam on the Columbia. The hydrology of the Lewis River is controlled by a dam as well. Because of the dams, process-based restoration is likely not possible, though wetland functions can be significantly enhanced on site through re-establishing wetland hydrology and wetland vegetation, and buffering the site with upland buffer area. Habitat interspersation can be significantly improved over existing conditions as well.

5.5.3 Clark County Regional Wetland Inventory and Strategy

The Clark County Wetland Inventory and Strategy notes that 85% of the area within the Ridgefield UGA is potentially wetland. Significantly, much of the area in the headwaters of Gee and Allen Canyon Creeks is zoned for future commercial and industrial uses. These uses are likely to impact headwater wetland areas and functions by increasing impervious surface area, and contributing to flashy hydrographic flows typical of urbanizing areas. The changes in hydrology affect wetland vegetation, structure, and function throughout the system in a cascading effect. Shallow groundwater recharge is likely to be negatively affected by impacts to headwater wetlands, as are water quality functions, including, but not limited to filtration.

The proposed Ridgefield Wetland Mitigation Bank site can significantly contribute to improving habitat and water quality wetland functions on-site, and also contributes to connectivity to adjacent habitats. While the Ridgefield Wetland Mitigation Bank site occupies a riverine landscape position, because of land use practices over the last hundred years, it functions more like a closed depressional wetland system than a dynamic riverine system. The bank site is in the Columbia River lowlands and its functions should be seen within that ecological context, as well as within the smaller basins described above. In addition, it should be noted here that the proposed Ridgefield Wetland Mitigation Bank site is within the proposed historic Columbia River Floodplain service area, while impacts to the wetlands located in the headwaters of the Ridgefield UGA are located within the proposed 'Terrace Unit' service area.

5.5.4 Conceptual Design Goals

- Restore and/or enhance hydrology and wetland area on the site disabling the ditching and tiling system which currently drains the pastures
- Restore a complex mosaic of cottonwood/ash wetland floodplain riparian forest native to the area
- Increase habitat complexity, structure, function, and interspersed
- Increase sediment trapping by increasing roughness
- Increase nutrient cycling and retention
- Increase native plant species richness and diversity
- Increase water quality and quantity on-site
- Control Reed Canary Grass and other invasive species (Himalayan black berry)
- Investigate opportunities for restoring the mouth of Gee Creek and other natural features on-site

5.5.5 Adjacent Land Use

Adjacent land uses are generally described above. However, the City of Ridgefield, located to the south, is proposing a new sewage line outfall. One of the proposed alternative outfall lines would cross the subject property from east to west roughly following the dike road along the northern portion of the proposed bank site along the East Fork of the Lewis River (Steve Wall, P.E. City of Ridgefield, personal communication, 2/23/07). Three alternative sewer line outfall routes are still under consideration and will be presented to Ridgefield City council in March of '07. If this northern line is selected as the preferred alternative, it is not likely to affect the wetland area of the proposed wetland mitigation bank site. The outfall siting is in the environmental scoping process at this time. Permitting and constructing the outfall is likely to take a number of years. CCMP will follow this process as it affects the proposed wetland mitigation bank site.

5.6 FARGHER LAKE WETLAND MITIGATION BANK SITE

5.6.1 Existing Conditions

The proposed Fargher Lake Wetland Mitigation Bank Site is located on approximately 110 acres of privately owned property in northern Clark County, within the proposed Lewis River Rain Zone service area (**Figure 4**). The site is a portion of a much larger historic wetland which is estimated to have historically covered approximately 560 acres of valley floor. Uplands rise around the wetland area on all sides. The existing wetland is in multiple property ownerships and is bisected by numerous roads including NE 156th Avenue which runs in a north-south direction through the middle of the area mapped as Semiahmoo muck by the NRCS¹⁰ (**Figure 15**). A water ski lake is visible in the eastern portion of the wetland (this lake is off site to the east, and is visible in the NRCS aerial map). The area proposed for a wetland mitigation bank is indicated in Figure 16.

A drainage plan was first developed for the lake in 1895. Though this initial effort was unsuccessful, drainage was again begun in 1918 and a drainage district, which is still active, was established in 1921. The drainage district still maintains active ditches on the proposed bank site. The ditches eventually connect to Rock Creek, a major tributary of the East Fork Lewis River.

The site has been farmed for mint since 1926. The current property owner, who has farmed the site for approximately the last 16 years, believes there are roughly 200,000 lineal feet of drainage tile on site

¹⁰ NRCS Web soil survey 1.1, <http://www.soils.usda.gov> Mapping provided courtesy of Ecological Land Services

which effectively drain the property¹¹. The location of the drain tiles is documented with property owner records, and is easily visible in the 1974 aerial photograph of the site. Active management of the drainage of the site has continued, and has been effective in draining the site for agricultural production purposes. The current property owner has added approximately 50,000 lineal feet of drain pipe over the last decade¹². A current wetland delineation does not exist, but is anticipated to be completed during the spring of 2007.

5.6.2 Site Selection Rationale

The proposed Fargher Lake Wetland Mitigation Bank site is located within the proposed Lewis River Rain Zone service area. CCPW and WSDOT have both identified a number of CIP projects within this area which may result in unavoidable impacts to wetlands. CCPW's intent in establishing a regional wetland mitigation banking program was to meet anticipated mitigation demand throughout its CIP project area. Establishing a wetland mitigation bank site within the proposed Lewis River Rain Zone service area meets that goal.

CCMP proposed adding this site to the Prospectus in early March of 2007. The MBRT supports adding the site to the proposal at this time, though the site has not received the same level of review as the other sites in this Prospectus. Additional review will occur throughout the wetland bank certification process.

5.6.3 Clark County Regional Wetland Inventory and Strategy

The wetland inventory did not include analysis of the East Fork Lewis River watershed, in which the proposed bank site is located. However, the mapping effort did include the site, which is located on map folio number 55. The area proposed as the Fargher Lake Wetland Mitigation Bank Site is mapped primarily as Hydric Soil D¹³.

5.6.4 Conceptual Design Goals

- Restore wetland hydrology by disabling drainage tiles on site
- Restore native wetland vegetation on site. The Semiahmoo muck soils are indicative of a historic emergent wetland vegetation community. Research will be required to determine the appropriate restoration design, including vegetative species to be planted on site.
- Increase native plant species richness and diversity
- Increase water quality and quantity on-site
- Increase groundwater storage on-site
- Increase flood protection to downstream property owners
- Maintain active drainage district ditches on site

5.6.5 Existing Easements

- A thirty foot easement will need to be provided for continued maintenance along the existing drainage ditch which establishes the eastern boundary of the proposed wetland mitigation bank,

¹¹ Perry Gilmour, personal communication, March 2007.

¹² Perry Gilmour, personal communication, March 2007.

¹³ Group D soils are clay loam, silt clay loam, sandy clay, silty clay or clay. This HSG has the highest runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with permanent high water table, soils with a claypan or clay layer at or near the surface and shallow soils over nearly impervious materials. Engineering Division of the Natural Resource Conservation Service, United States Department of Agriculture, Technical Release- 55.

and also runs east-west through the proposed bank site. (The NRCS map shows the ditch running north into Fargher pond; the drainage district ditch actually defines the eastern edge of the proposed bank property and then runs east-west through the proposed wetland mitigation bank site).

5.6.6 Adjacent Land Use

Adjacent land uses include agriculture to the east, and rural residential development on the upland perimeter of the proposed wetland mitigation bank site (not on the site, and not included in the proposal). Two private residential properties are located in the northwest corner of the proposed bank site, and comprise approximately 20 acres. They are bisected by the drainage district ditch in an east-west direction. These property owners may be asked to allow a conservation easement to be placed on a portion of their property, to include as much of the historic wetland area in the proposal as possible. Property to the east of the bank site is in active blueberry farm production. The land on which the proposed wetland mitigation bank site is located is zoned agricultural by Clark County.

6.0 REFERENCES

Analysis of federally issued Clark County permits was performed by Gail M. Terzi of the Seattle District Corps of Engineers in preparation for a wetland mitigation banking workshop presented at the Society of Wetland Scientists meeting in Seattle, July 22, 2004. Used with permission.

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Hovee & Associates, May 20, 2002. The Economic Development Strategic Plan for Clark County. Prepared for the Columbia River Economic Development Council.

Vancouver Audubon website posts information regarding Steigerwald National Wildlife Refuge at vancouveraudubon.org/steigerwaldnwr.html.

Washington Department of Ecology, (www.ecy.wa.gov) the method for watershed characterization is documented in Protecting Aquatic Ecosystems, Ecology publication # 05-06-027, available at <http://www.ecy.wa.gov/pubs/0506027.pdf>

Clark County, WA Major Watersheds



- Watershed
- Major Roads
- Major Streams
- Water Bodies
- Basin boundaries**
- BEACON ROCK
- EAST FORK
- MERWIN
- SALMON
- ST. HELENS
- WASHOUGAL

(Scale 1:220000)
8000 0 8000 16000 24000 32000 Feet

Department of Assessment & GIS



Plot Date: Sep 14, 2004 Map produced by: daw
Information shown on this map was collected from several sources. Neither Clark County or the agency producing this document accept responsibility for any inaccuracies that may be present.



Figure 1 - Clark County and Major Watersheds

LOWER COLUMBIA RIVER ESTUARY PROGRAM STUDY AREA

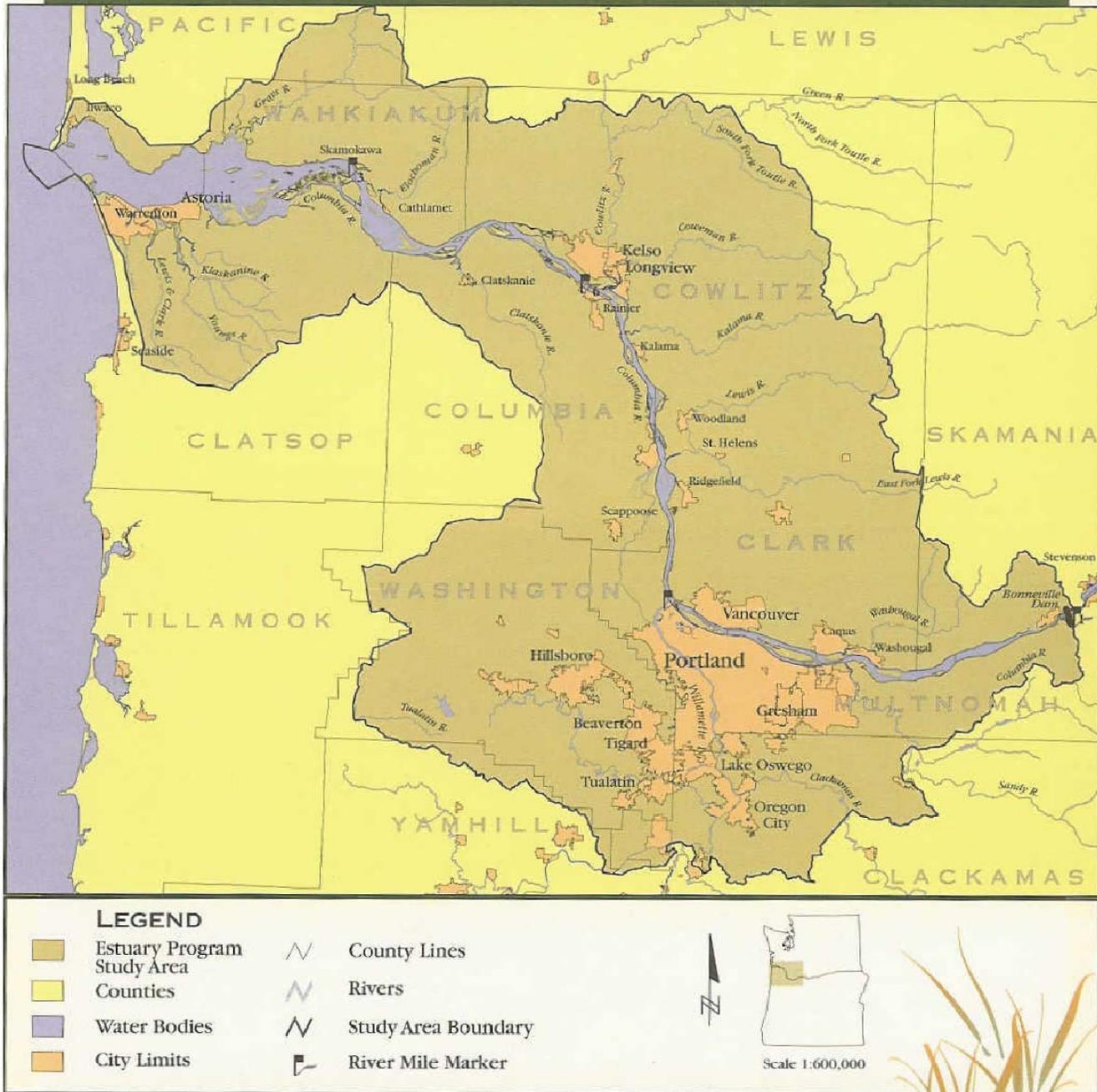


Figure 2 - Lower Columbia River (River Mile 0-146)

Clark County, WA Urban Growth Areas



- County boundary
- Urban Growth Boundary
- Major Roads
- Major Streams
- Water Bodies
- Municipal Jurisdiction**
- Unincorporated
- Incorporated

(Scale 1:220000)
10000 0 10000 20000 30000 40000 Feet

Department of Assessment & GIS



Plot Date: Sep 13, 2004 Map produced by: daw
Information shown on this map was collected from several sources. Neither Clark County or the agency producing this document accept responsibility for any inaccuracies that may be present.

Figure 3 - Clark County, Cities, and Urban Growth Areas

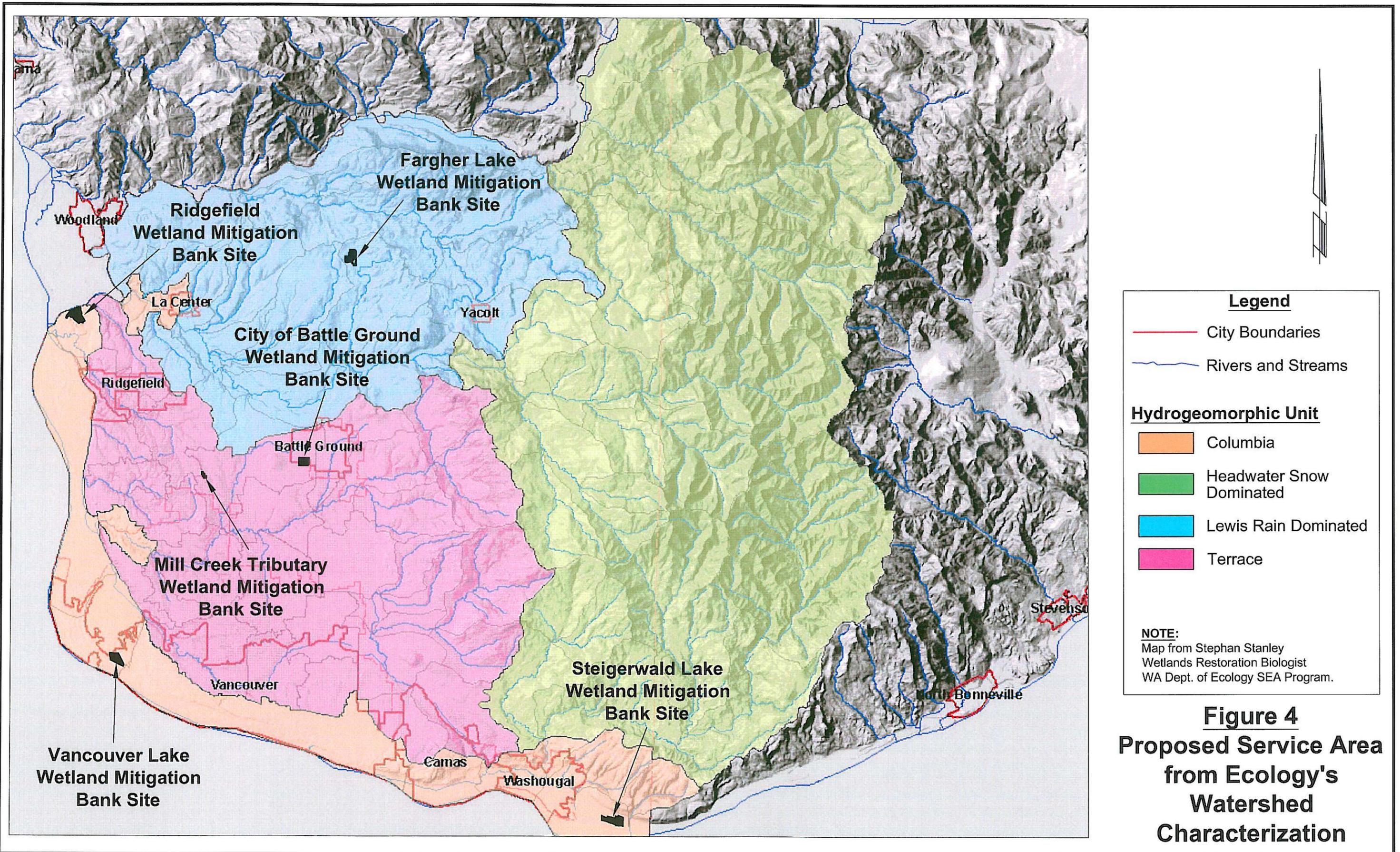
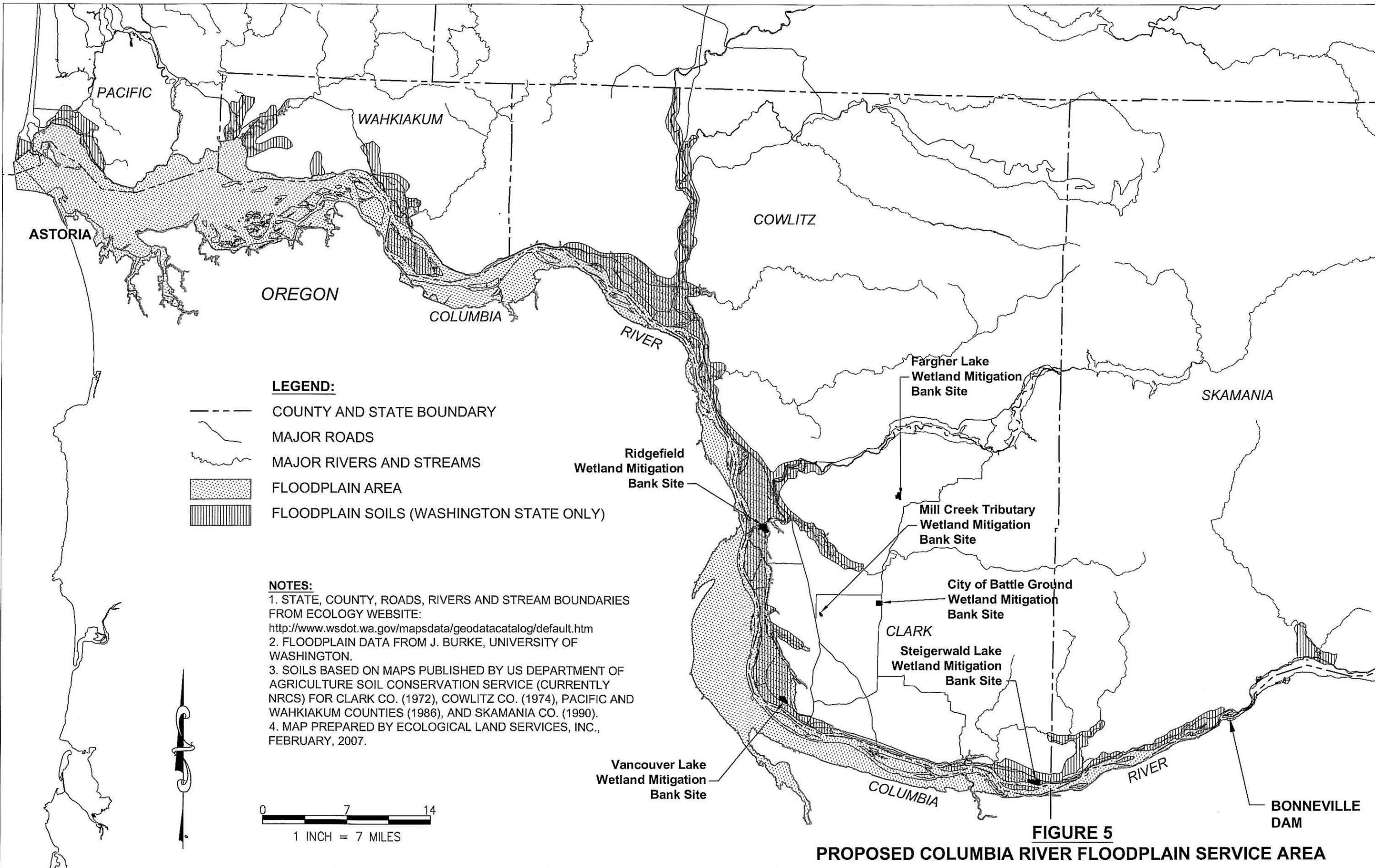


Figure 4
Proposed Service Area
from Ecology's
Watershed
Characterization



LEGEND:

- COUNTY AND STATE BOUNDARY
- MAJOR ROADS
- ~ MAJOR RIVERS AND STREAMS
- [Stippled pattern] FLOODPLAIN AREA
- [Vertical line pattern] FLOODPLAIN SOILS (WASHINGTON STATE ONLY)

NOTES:

1. STATE, COUNTY, ROADS, RIVERS AND STREAM BOUNDARIES FROM ECOLOGY WEBSITE: <http://www.wsdot.wa.gov/mapsdata/geodatacatalog/default.htm>
2. FLOODPLAIN DATA FROM J. BURKE, UNIVERSITY OF WASHINGTON.
3. SOILS BASED ON MAPS PUBLISHED BY US DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE (CURRENTLY NRCS) FOR CLARK CO. (1972), COWLITZ CO. (1974), PACIFIC AND WAHKIAKUM COUNTIES (1986), AND SKAMANIA CO. (1990).
4. MAP PREPARED BY ECOLOGICAL LAND SERVICES, INC., FEBRUARY, 2007.

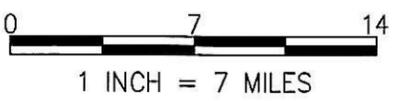


FIGURE 5
PROPOSED COLUMBIA RIVER FLOODPLAIN SERVICE AREA

Ridgefield
Wetland Mitigation
Bank Site

Fargher Lake
Wetland Mitigation
Bank Site

Mill Creek Tributary
Wetland Mitigation
Bank Site

City of Battle Ground
Wetland Mitigation
Bank Site

Steigerwald Lake
Wetland Mitigation
Bank Site

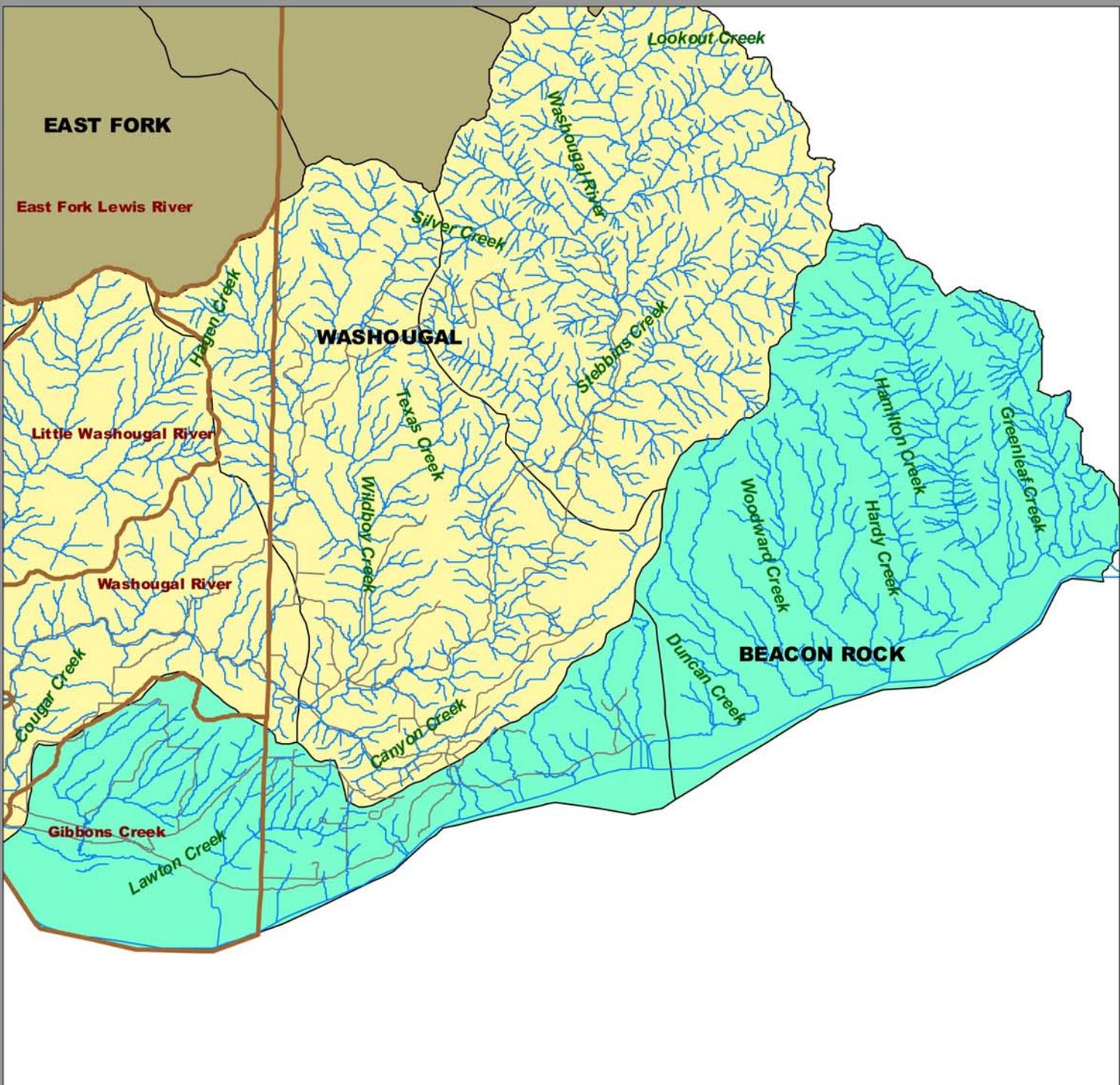
Vancouver Lake
Wetland Mitigation
Bank Site

BONNEVILLE
DAM



FIGURE 6
CLARK COUNTY WATERSHEDS

Beacon Rock Watershed



- Watershed
- Hyd28.shp
- Major Roads
- Skamania roads
- Wna27_28.shp
- ADAMS
- BEACON ROCK
- EAST FORK
- KALAMA
- MERWIN
- SALMON
- ST. HELENS
- WASHOUGAL

Department of Assessment & GIS



Plot Date: Sep 15, 2004
Map produced by: daw

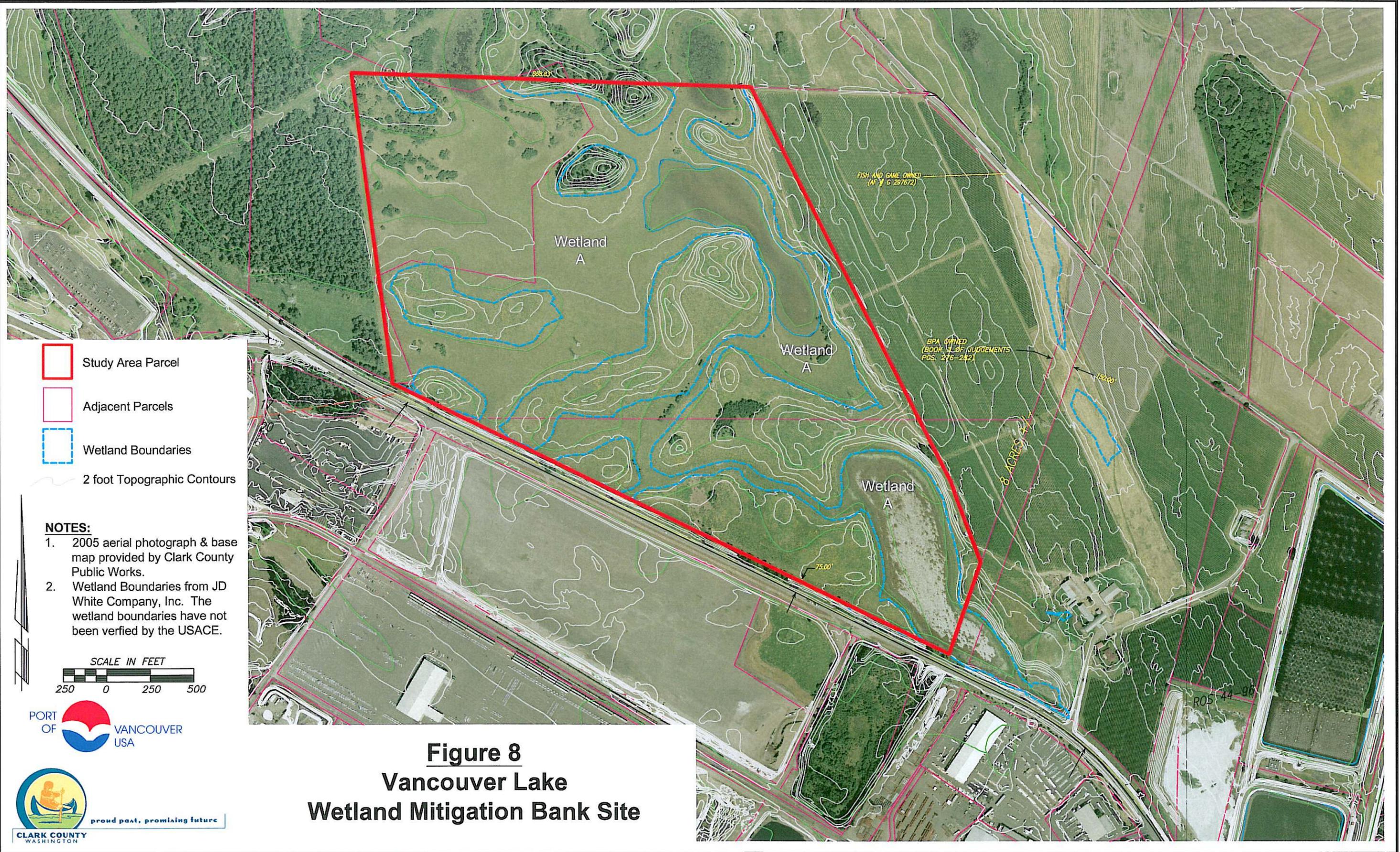
Information shown on this map was collected from several sources. Neither Clark County or the agency producing this document accept responsibility for any inaccuracies that may be present.



(Scale 1:164000) 6000 0 6000 12000 18000 24000 Feet



Figure 7 - Beacon Rock Watershed



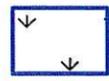
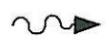
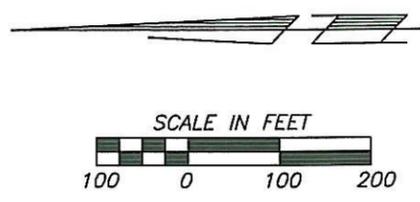
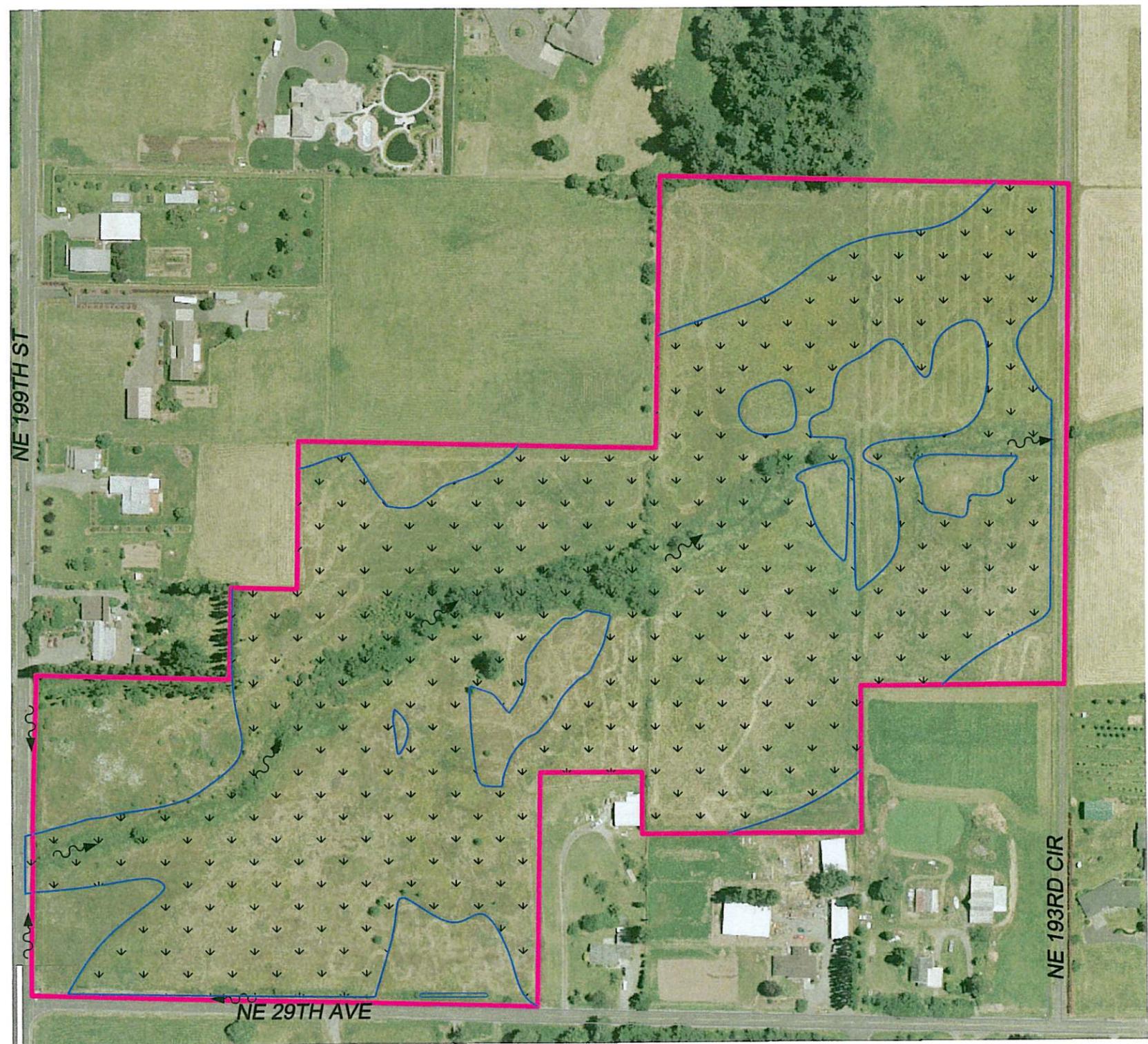
-  Site Boundary
-  Wetland Boundary
-  Stream
-  Flow Direction
-  2-foot Topographic Contour
-  10-foot Topographic Contour

Figure 9
Mill Creek Tributary
Wetland Mitigation Bank Site



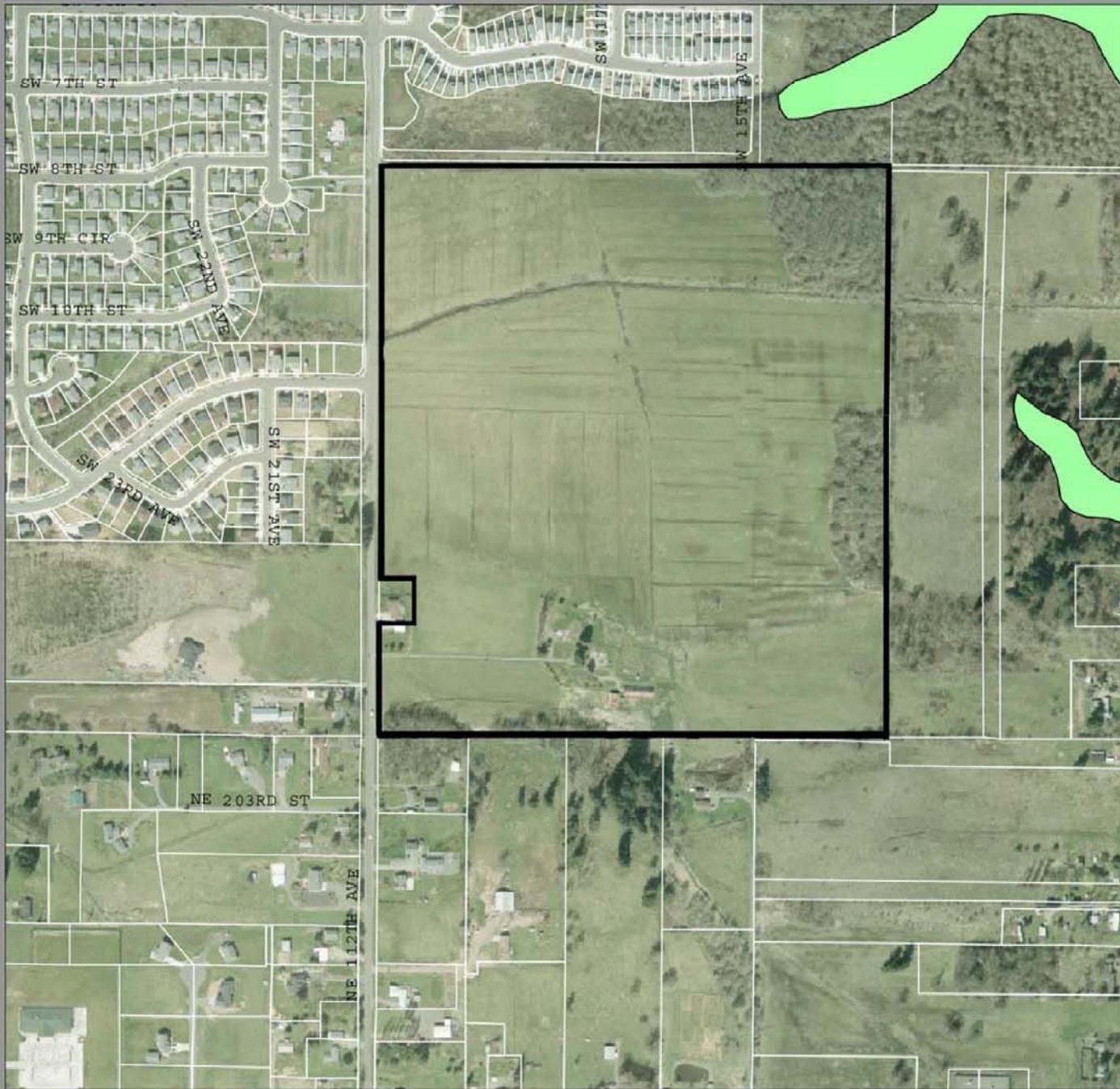


Figure 10
City of Battle Ground
Wetland Mitigation
Bank Site

SW 1/4 of Section 03 T3R2E WM

Serial Number: 192362-000
 Owner: CITY OF BATTLE GROUND
 Address: 20521 NE 112TH AV

 High Quality Wetlands

Department of Assessment & GIS

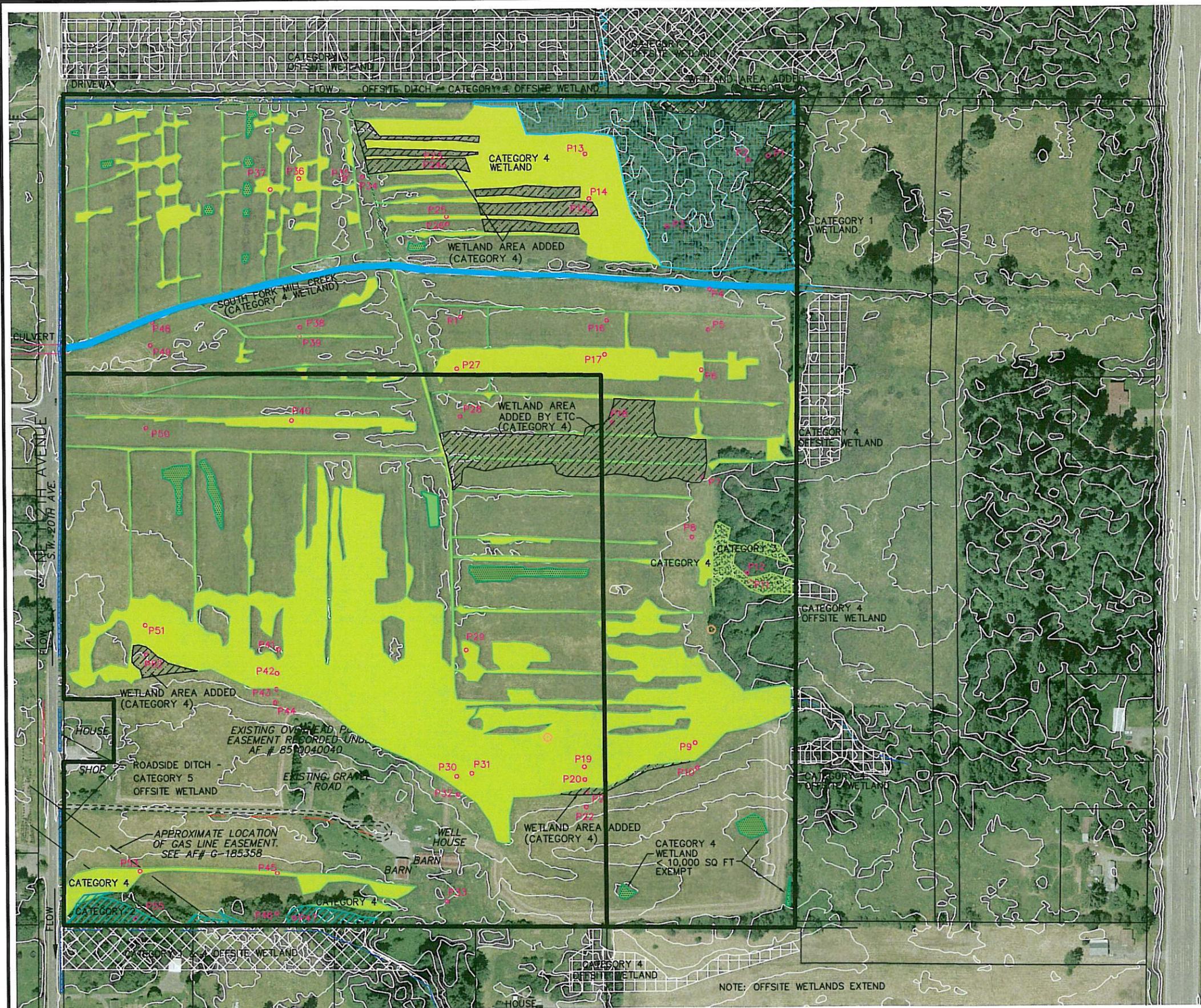


Plot Date: Sep 13, 2004
 Map produced by: daw
 Information shown on this map was collected from several sources. Neither Clark County or the agency producing this document accept responsibility for any inaccuracies that may be present.



2002 Orthophotography

Figure 11 City of Battle Ground Wetland Mitigation Bank Site - Wetland Delineation Overlay

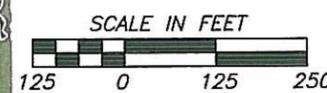


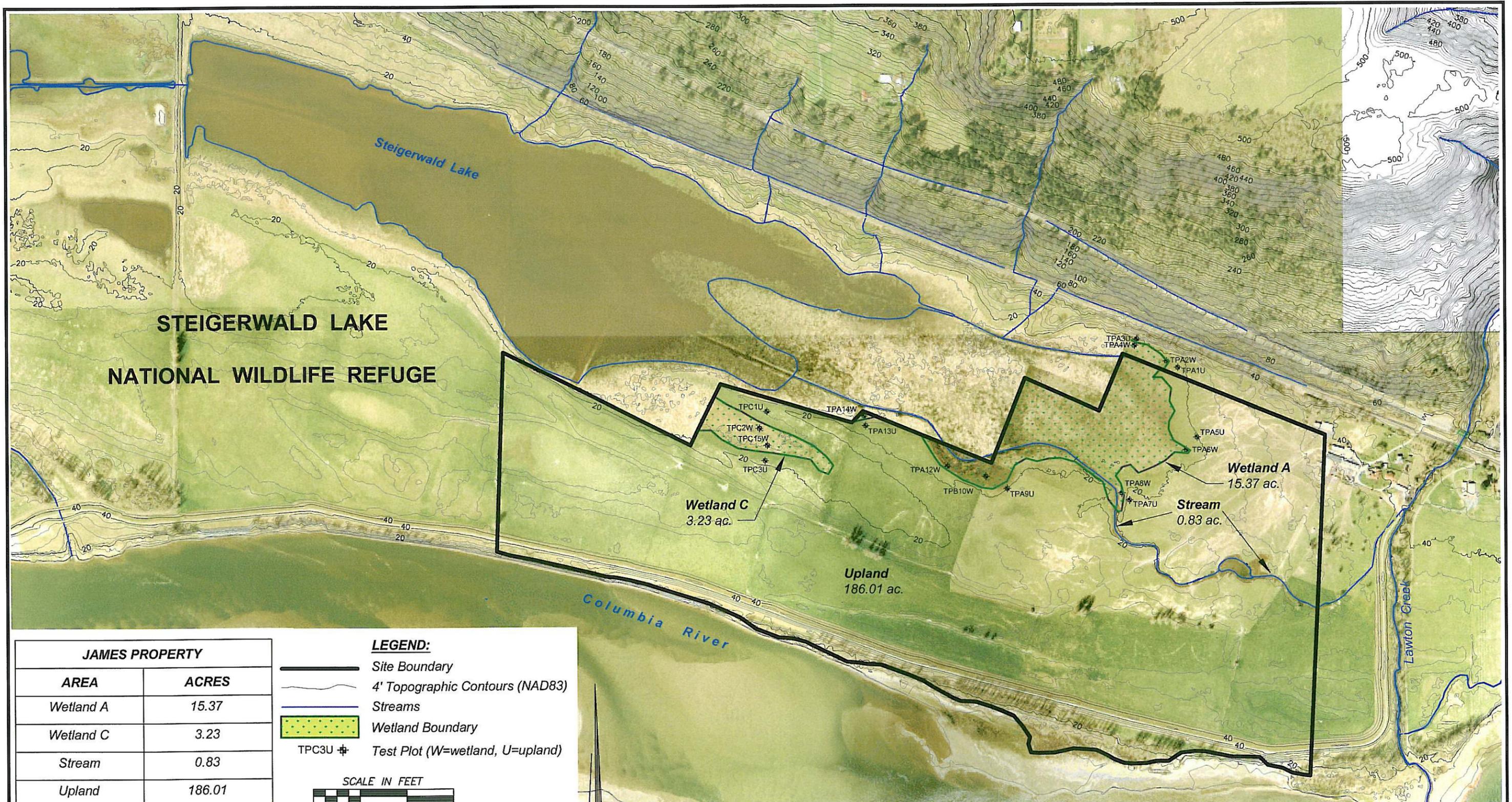
LEGEND:

-  CATEGORY 1
Depressional Outflow
(4.09 acres, 178,322.39 ft²)
-  CATEGORY 2
Depressional Outflow
(0.46 acres, 20,114.34 ft²)
-  CATEGORY 3
(0.34 acres, 14,800.89 ft²)
-  CATEGORY 4
Depressional Closed
(0.54 acres, 23,573.73 ft²)
-  CATEGORY 4
Depressional Outflow
(17.26 acres, 752,036.47 ft²)
-  WETLAND ADDITIONS
(3.41 acres, 148,364.91 ft²)
-  SOUTH FORK MILL CREEK
(0.518 acres, 22,556.99 ft²)
-  STUDY PARCELS
-  ADJACENT PARCELS
-  2 FOOT TOPOGRAPHIC CONTOURS

NOTES:

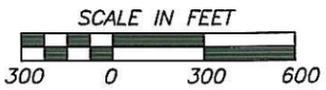
1. 2005 aerial photograph & base map provided by Clark County Public Works.
2. Wetland boundaries from map provided by Environmental Technology Consultants, 04-26-99.
3. Gas line easement from survey map provided by Hagedorn, Inc., 01-22-01.





JAMES PROPERTY	
AREA	ACRES
Wetland A	15.37
Wetland C	3.23
Stream	0.83
Upland	186.01
Total	205.44

- LEGEND:**
- Site Boundary
 - 4' Topographic Contours (NAD83)
 - Streams
 - Wetland Boundary
 - Test Plot (W=wetland, U=upland)



- NOTES:**
- 2002 Orthophoto and property boundary from Clark County GIS, 2005.
 - Topographic contours and wetland flags were surveyed by Ducks Unlimited staff June, 2005.
 - Wetland boundaries delineated by Habitat Bank, LLC, May, 2005, and Ecological Land Services, Inc. (ELS), September, 2005.

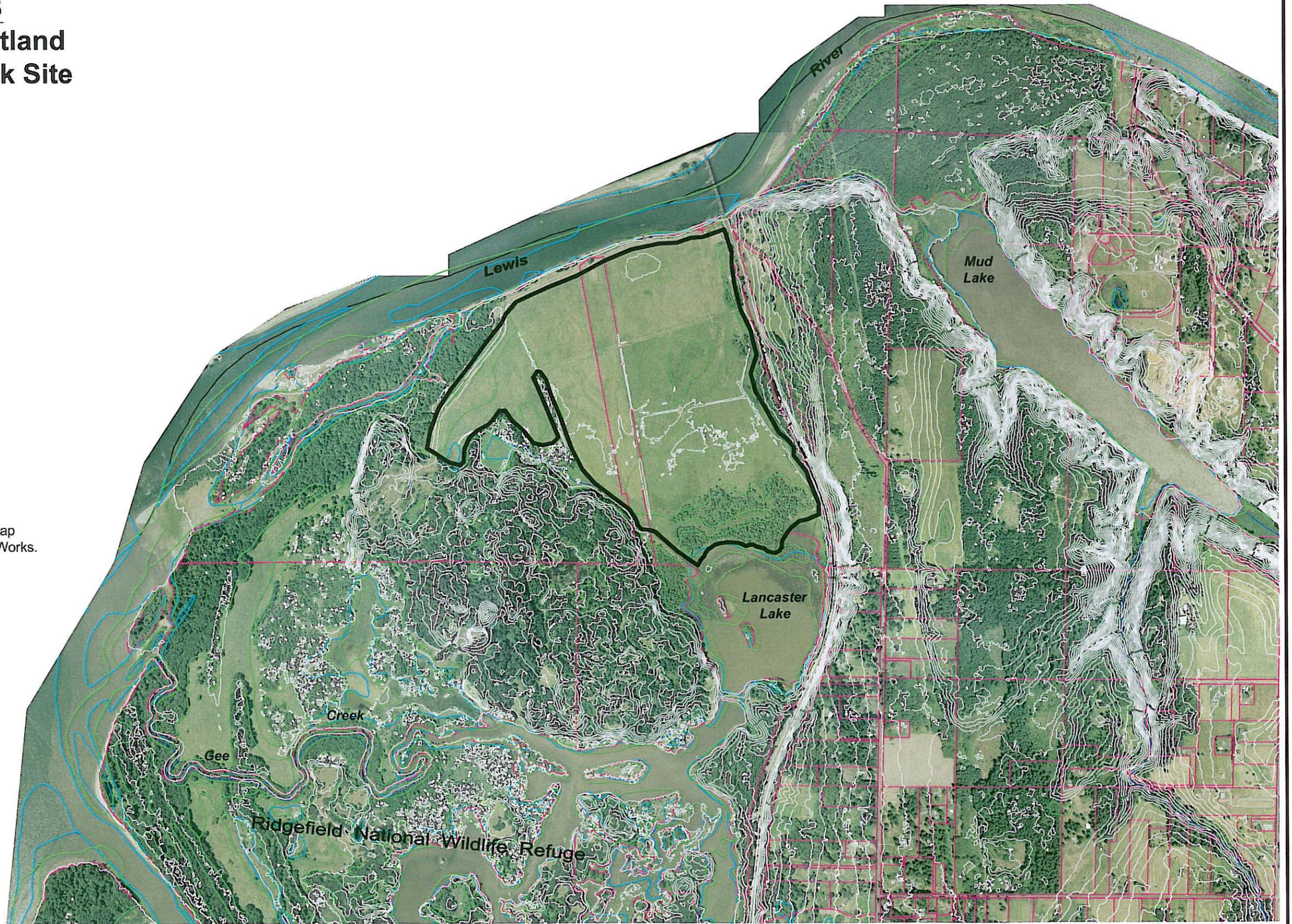
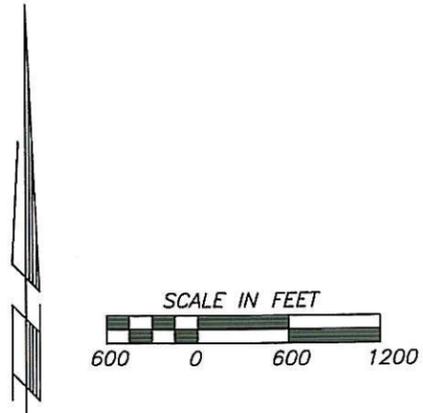
Figure 12
Steigerwald Lake
Wetland Mitigation Bank Site

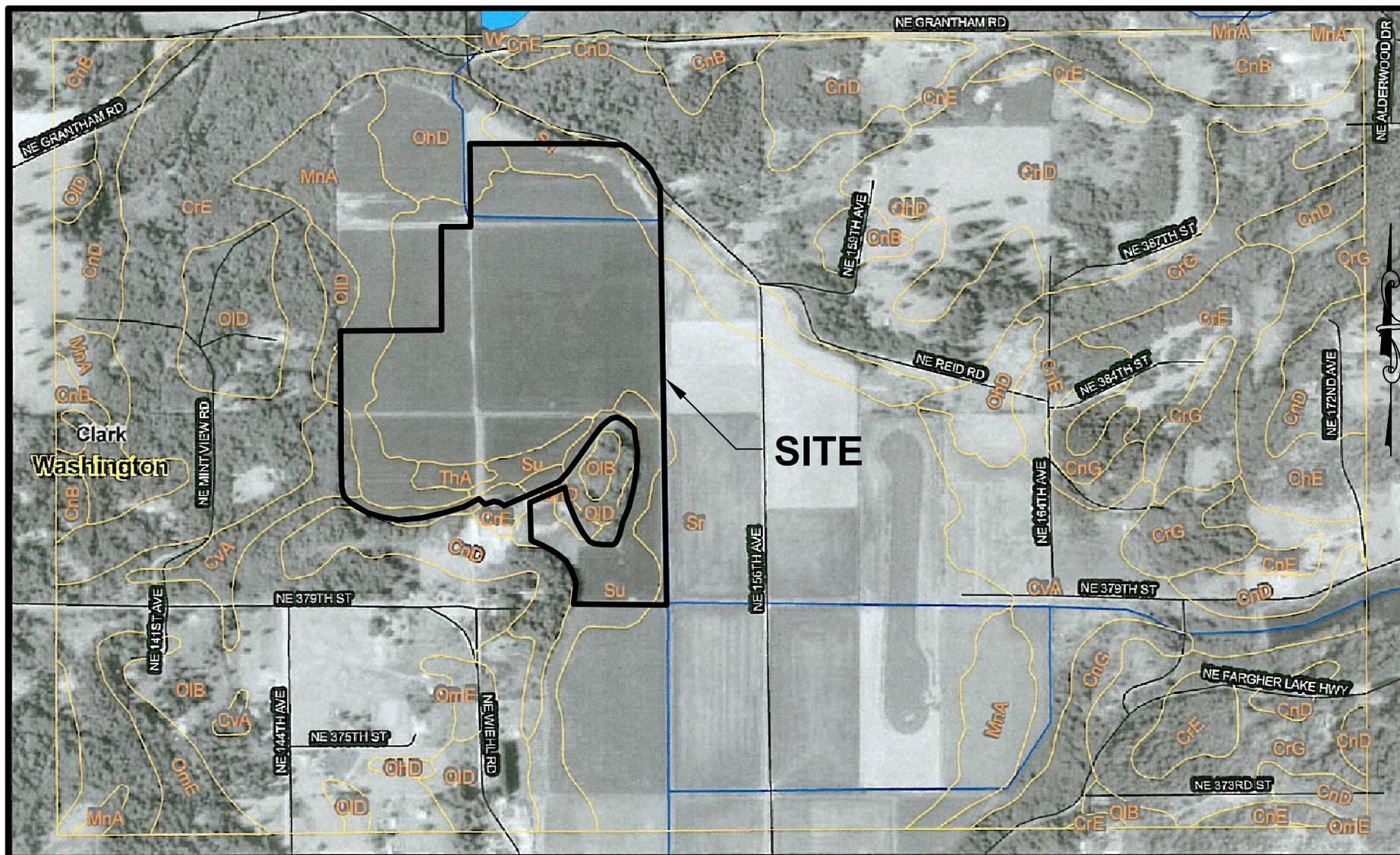


Figure 13
Ridgefield Wetland
Mitigation Bank Site

-  Study Area Parcels
-  Adjacent Parcels
-  NWI Mapped Wetland
-  10 foot Topographic Contour

NOTE:
 1. 2005 aerial photograph & base map provided by Clark County Public Works.



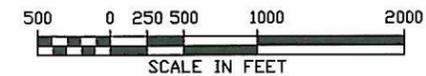
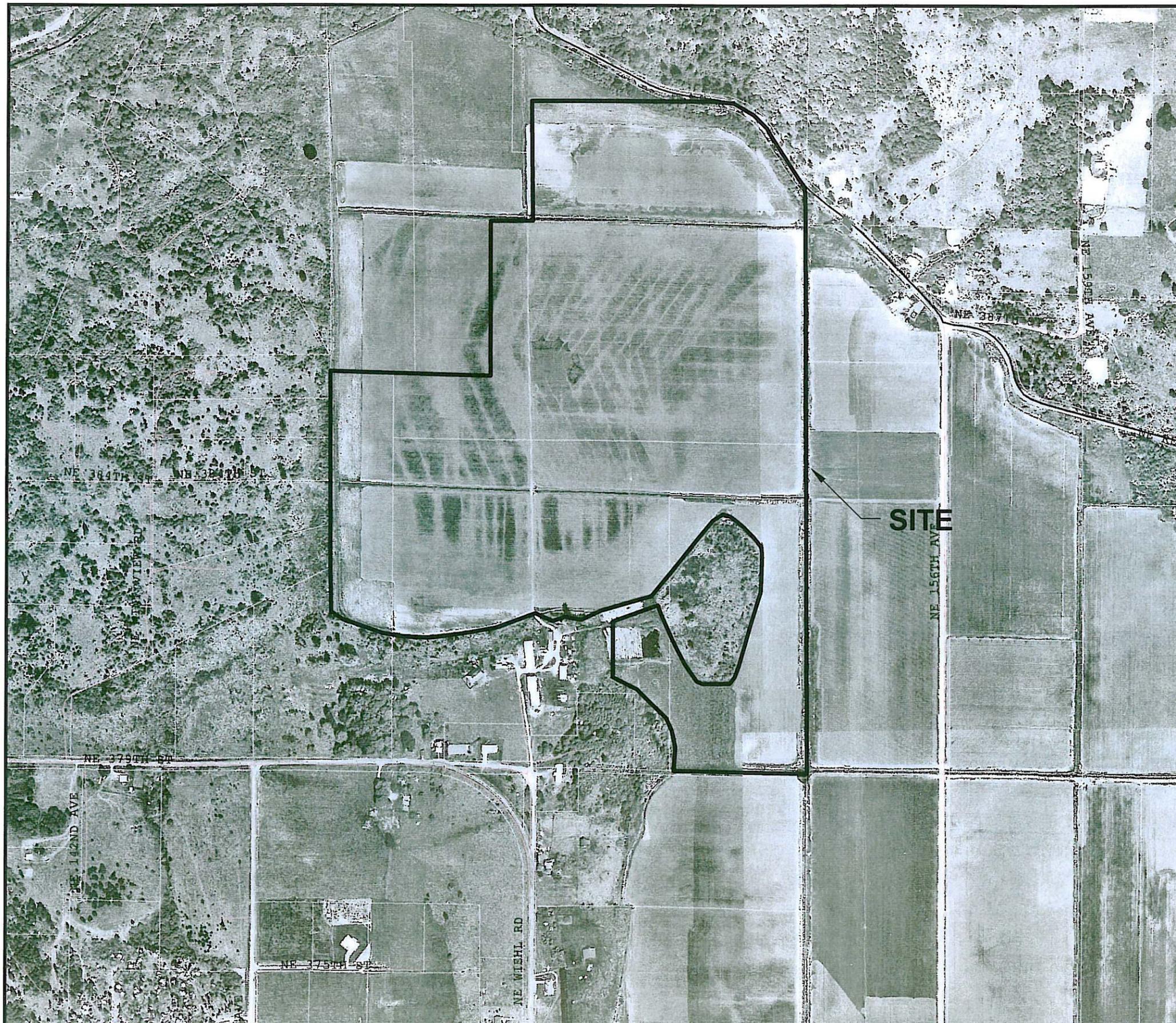


LEGEND:

- CrE - Cinebar stony silt loam, 3 to 30 percent slopes. Not hydric.
- CvA - Cove silty clay loam, 0 to 3 percent slopes. Not hydric.
- MnA - Minniece silty clay loam, 0 to 3 percent slopes. Hydric.
- OhD - Olequa silty clay loam, heavy variant, 3 to 20 percent slopes. Not hydric.
- OIB - Olympic clay loam, 3 to 8 percent slopes. Not hydric.
- OID - Olympic clay loam, 8 to 20 percent slopes. Not hydric.
- Sr - Semiahmoo muck. Hydric.
- Su - Semiahmoo muck, shallow variant. Hydric.
- ThA - Tisch silt loam, 0 to 3 percent slopes. Hydric.



FIGURE 15
NRCS SOILS MAPPING of
FARGHER LAKE WETLAND MITIGATION BANK SITE



1974 Aerial Photo



Assessment & GIS

Plot Date: January 12, 2006

Map produced by: LM

Information shown on this map was collected from several sources. Neither Clark County or the agency producing this document accept responsibility for any inaccuracies that may be present.

Figure 16
Fargher Lake
Wetland Mitigation Bank Site