City of Sedro-Woolley
Grant No. G1100233

City of Sedro-Woolley
Shoreline Management Program Update

Shoreline Characterization and Analysis
Final Draft May 2013

Table of Contents 2
Introduction 3
Objectives of Shoreline Analysis and Characterization 3
Shoreline Jurisdiction 4
Skagit River Watershed 6
Shoreline Inventory and Specific Local Conditions 7
Land Use 8
Transportation 9
Utilities 10
Stormwater Utility 10
Sanitary Sewer 10
Impervious Surfaces and Vegetation 11
Shoreline Modifications 11
Public Access Areas 12
Critical Areas 12
Wetlands 12
Aquifer Recharge Areas 13
Fish and Wildlife Habitat Conservation Areas 13
Frequently Flooded Areas 14
Channel Migration Zones and Floodplains 14
Archeological and Historical Resources 15
Areas of Special Interest 16
Restoration Opportunities 16
Map Portfolio 17

Introduction

The Washington State Shoreline Management Act of 1971 (SMA) was enacted for the purpose of comprehensively managing and protecting the state's shorelines. The SMA (Chapters 90.58 RCW and 173-26 WAC) emphasizes accommodation of appropriate uses that require a shoreline location, protection of shoreline environmental resources and protection of the public's right to access and use the shorelines.

Under the SMA, each city and county with shorelines of the state must prepare and adopt a Shoreline Master Program (SMP) that is based on state laws and rules but is tailored to the specific geographic, economic and environmental needs of the community. The SMP is essentially a combined comprehensive plan, zoning ordinance, and development permit system for shoreline-specific uses. Shorelines of the state include those lands extending landward for two hundred feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward two hundred feet from such floodways; and all wetlands and river deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of this chapter; the same to be designated as to location by the department of ecology." (RCW 90.58.030(2)(d))

The Skagit River, as well as the adjoining jurisdictional lands, meets the definition for a shoreline of the state; therefore the City of Sedro-Woolley passed a SMP in 1979. The City's SMP is now being updated as required by the State. The State Department of Ecology (Ecology) is the regulatory body in charge of overseeing the City's SMP update. Ecology is also providing technical support and partial funding for the update.

Objectives of Shoreline Analysis and Characterization

This Shoreline Analysis and Characterization will describe existing conditions and characterize ecological functions in the shoreline jurisdiction. This will serve as the baseline against which the impacts of future development actions in the shoreline will be measured. Ecology's guidelines require that the City demonstrate that its updated SMP yields "no net loss" in shoreline ecological functions relative to the baseline due to its implementation. Using the inventory of data, plans, studies, inventories, maps, etc, this report is intended to:

- Present the geographic and jurisdictional context for the SMP update;
- Characterize ecosystem processes and functions;
- Present reach level analysis information;
- Identify potential use conflicts to inform environment designation and allowed use decisions;

- Develop shoreline management measures for protection and restoration of ecological functions, SMP policies, regulations, and environment designations based on the findings of the inventory and characterization; and
- Organize relevant data for efficient review and use in the cumulative impact analysis.

Shoreline Jurisdiction

The SMA applies to "those lands extending landward for 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward 200 feet from such floodways; and all wetlands and river deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of this chapter…Any county or city may determine that portion of a one hundred year floodplain to be included in its master program as long as such portion includes, as a minimum, the floodway and the adjacent land extending landward two hundred feet there from… Any city or county may also include in its master program land necessary for buffers for critical areas (RCW 90.58.030)."

According to Ecology's list of streams based on the results of three USGS regional stream flow studies, the Skagit River is the only jurisdictional stream in or adjacent to Sedro-Woolley. No other streams meet the 20 cubic feet per second (cfs) mean annual flow requirement, and there are no large lakes or marine waters in or adjacent to Sedro-Woolley.

The entire stretch of the Skagit River, which is adjacent to the southern portion of the city, is designated as a "shoreline of statewide significance." Per RCW 90.58.202, while developing master programs for shorelines of statewide significance, local governments shall give preference to uses in the following order of preference which:

1. Recognize and protect the statewide interest over local interest;
2. Preserve the natural character of the shoreline;
3. Result in long term over short term benefit;
4. Protect the resources and ecology of the shoreline;
5. Increase public access to publicly owned areas of the shorelines;
6. Increase recreational opportunities for the public in the shoreline;
7. Provide for any other element as defined in RCW.

This report will help determine the course of future development in the Skagit River shoreline within Sedro-Woolley, keeping in mind legislature's mandate to manage uses while considering the above preferences.

The preliminary shoreline jurisdiction has been determined and documented in the City's *Preliminary Assessment of Shoreline Jurisdiction* report. That preliminary determination uses Ecology's minimum jurisdiction criteria (Option 1) and found approximately 44.75 acres of shoreline to be in the City's shoreline jurisdiction plus some wetlands that are within City limits and the 100 year floodplain. The regulatory jurisdiction, the Shoreline Management Zone (SMZ), includes wetlands within the Skagit River's 100 year flood plain, but not wetland buffers. This report will examine in detail the jurisdiction area within City limits. That acreage is confined to one contiguous geographic location in the City, making it possible to the area in one map. Therefore only one "shoreline reach" – or study area – is necessary for the Sedro-Woolley SMP. This differs from other local governments that have larger, more diverse shoreline jurisdictions whose SMP contains several reaches. The small shoreline reach in Sedro-Woolley is not particularly diverse, nor is it very expansive when compared to the shoreline jurisdictions of other local governments.

Skagit River Watershed

The shoreline jurisdiction within Sedro-Woolley is a small part of the greater Skagit River drainage system that drains 3,130 square miles of watershed (2,730 square miles in Washington and 400 in British Columbia). Flowing from the mountains of British Columbia to the Puget Sound, the main stem of the Skagit River is over 160 miles long; 1,400 linear feet of which is adjacent to Sedro-Woolley city limits. Upriver, the Skagit is characterized by steep, mountainous terrain. The lower reaches of the river are characterized by areas of wide floodplain close to the main channel, expanding into a large alluvial plain towards its western terminus at Puget Sound.

Historically, the river meandered through the floodplain in its lower reaches. Subsequent to the removal or the river's ancient logjams and the erection of an extensive system of dams and dikes, the channel has been largely static at its lower reaches. Flooding is still pronounced at the river's terminus, but is mostly contained within altered banks through urbanized areas. As the river makes its way to the Puget Sound, it passed through the communities of Newhalem, Marblemount, Concrete, Lyman, Hamilton, Sedro-Woolley, Burlington and Mount Vernon. At Newhalem, the last of three major dams on the main stem of the river regulates the amount of water flowing downstream. The Baker dam, in Concrete, also regulates the flow of the Baker River, a large tributary to the Skagit. Despite the upstream manipulation of flow and extensive system of dikes downriver, flooding has not been eliminated.

Aside from its influence on the natural landscape and human development in Skagit County, the Skagit River also plays an important role in the life cycle of several fish species indigenous to the northwest. Five species of salmon use the Skagit River including the Endangered Species Act-protected Puget Sound Chinook (*Oncorhynchus tshawytscha*). Of the species that use the Skagit River, only the Lower Skagit Fall Chinook salmon spawn in the lower watershed. However, near shore habitat may be used by salmon. Side channels are associated with a higher density of juvenile Chinook rearing habitat than in the main stem Skagit River (Hayman et al. 1996). The removal of large woody debris and addition of dikes, along with the urbanization along its banks, has reduced naturally occurring impediments to flow and the amount of shade-providing trees. As a result the river moves faster and fewer shaded, slower moving areas that are favored by fish are available than existed in the past.

Shoreline Inventory and Specific Local Conditions

The Sedro-Woolley jurisdictional shorelands are contained within the 100 year FEMA flood plain. Maps 1.1 and 1.2 indicate the preliminary shoreline jurisdiction as determined in the Sedro-Woolley *Preliminary Assessment of Shoreline Jurisdiction* report. These maps show the entire city for perspective of the Skagit River's influence on the City and the region. Maps 1.1 and 1.2 also show wetlands in the vicinity of Sedro-Woolley. Any wetlands that are adjacent to or within City limits and the 100 year flood plain are also under SMP jurisdiction. The shoreline reach is depicted in Maps 2.1 and 2.2; these maps offer a closer view to aid in the detailed examination of existing or baseline conditions upon which the development of shoreline master program provisions will be examined.

The City of Sedro-Woolley falls within Ecology's Water Resource Inventory Area (WRIA) #3, which is encompasses the lower portion of the Skagit River watershed. There are roughly 1,400 linear feet of Skagit River adjacent to the southern boundary of Sedro-Woolley. Through this section, the river is highly channelized, despite being in the lower floodplain of the river. The current is typically swift moving and the river bank mostly steep, though not armored. Some areas of low-bank exist in the jurisdiction, though those areas are very small. There are no man made dikes on the Skagit River in the Sedro-Woolley area.

The following analysis identifies the ecosystem-wide processes that affect ecological functions within the shoreline jurisdiction. Defined in WAC 173-26-020, ecosystem-wide functions are: "the suite of naturally occurring physical and geologic processes of erosion, transport, delivery, and deposition; and specific chemical processes that shape landforms within a specific shoreline ecosystem and determine both the types of habitat and the associated ecological functions" (WAC 173-26-020-14).

Ecological functions or shoreline functions are defined in WAC 173-26-020-13 as: "the work performed or role played by the physical, chemical, and biological processes that contribute to the maintenance of the aquatic and terrestrial environments that constitute the shoreline's natural ecosystem."

Ecology's guidelines require that local jurisdictions gather, to the extent information is relevant and readily available, the information listed below. Each of the following inventory elements are subsequently broken into subsections and examined in detail for the City's sole shoreline reach. Regulations that are relevant to the jurisdiction and gaps in existing data area included in each section above as appropriate. The inventory elements examined are:

- Land Use and existing structures
- Transportation
- Utilities
- Impervious surfaces and vegetation

- Shoreline modifications
- Pubic access area
- Critical areas
- Channel migration zones and floodplains
- Archeological and historical resources
- Areas of special interest
- Restoration opportunities

Land Use

Maps 3.1 and 3.2 show the zoning for the shoreline reach. There are 34 acres of Public Zoning, 5 acres of Open Space and 3.5 acres of Residential 7 zoning in the preliminary shoreline jurisdiction.

The 3.5 acres of Residential zoned land contains no structures. This area does include parking facilities and landscaping for an assisted living facility. However, the facility building itself lies outside the 100 year floodplain, thus outside the shoreline jurisdiction.

The 5 acres of Open Space Zoning contains two little league baseball fields and a pump house that belongs to Skagit Public Utility District #1 (PUD). PUD provides water to the City of Sedro-Woolley and other Skagit County municipalities.

34 acres of shoreline jurisdiction are in the Public Zone. On this land is Riverfront Park a large City park adjacent to the Skagit River, south of River Road. The River typically runs fast through this stretch, so public access to the river is severely restricted. A public boat launch exists at the eastern edge of the park. The boat launch is catalogued by the Washington State Recreation and Conservation Office as the Sedro-Woolley (WDFW) - Skagit River boat launch, having a gravel parking lot and vault-style restroom.

Riverfront Park has children's play areas, roughly 10 acres of open fields, several more acres of treed river bank area, and a RV park. There are five permanent structures in this area of Public zone: a caretaker's residence (manufactured home); two picnic shelters with restroom facilities; one pole building style picnic shelter; and a band shell (amphitheater), which is also an open structure (roof on four poles). With the exception of the amphitheater, all the structures are on a high area in the park that may be above the floodway, but within the floodplain. To the knowledge of longtime City employees, these structures have not flooded. The 100 year floodplain map may be inaccurate, as anecdotal information suggests that the raised area in the park where these four structures are located is actually above 100 year floodplain elevation. Floodplain and floodway data was retrieved from the US Army Corps of Engineers GIS database. The FEMA floodway GIS information also excludes a large "island" in the shape of a city

parcel from the floodway. Though it is likely that much of that island is not in the floodway, the shape of that island is likely not to be accurate. FEMA will be consulted to remedy this mapping irregularity and fill in the gap in the existing data. The amphitheater in this island area, but is likely in the floodway. It has been constructed as on open structure so as not to impede flowing water (and to withstand flowing water and accompanying floating debris).

To the west of the main park area is a narrow tract of treed, undeveloped land between River Road and a housing development. In this area there is a channel that is dry for much of the area. Although it is not an approved City park use, this area is frequented by BMX and mountain bike riders.

North of River Road the Public zone contains a dog park and another approximately 10 acres of unused area containing a non-fish bearing, intermittent stream. The vegetation in this area is a mix of field weeds (blackberry, thistle, grasses, etc), scrub brush and alder trees.

The City's development regulations (zoning (Title 17 SWMC), subdivision (Title 16 SWMC) and building (Title 15 SWMC) codes) apply to land use and development within City limits. Both the development regulations and the City Comprehensive Plan are growth management compliant. Therefore, the goals, policies and regulations of the Washington State Growth Management Act (RCW 36.70A), including the critical areas requirements (see Critical Areas section below) have been satisfied.

Transportation

Roadways and driveways have the potential to affect water quality and the timing of water delivery to surface waters in the shoreline jurisdiction. Impervious surfaces used for vehicles collect pollution generated by vehicles during dry weather. Those pollutants then may be washed off into surface waters during rain events. Impervious surfaces also allow stormwater to be delivered to local waters at a faster rate than from areas without impervious surfaces. The City's stormwater rules (Title 13 SWMC) and Ecology's stormwater regulations apply to development and redevelopment in the City as a whole, as well as the shoreline jurisdiction.

The remaining balance of the 44.75 acres in the shoreline jurisdiction that are not accounted for in the Land Use section above is the River Road right of way (ROW) – about 2.25 acres. The River Road ROW contains a chip-sealed road surface and roadside grass. There are no structures (excepting utility poles and road signs) in the ROW. There are four gravel parking lots, one for Riverfront Park, one for the RV Park, one for a boat launch and a fourth for both the ball fields and Bark Park.

There are no railways, state highways, ferry crossings or airports in the Sedro-Woolley shoreline jurisdiction.

Utilities

Based on the Sedro-Woolley GIS database of large transmission utility pipelines and power lines, there are no natural gas pipelines or PSE electric transmission lines in or near the jurisdiction area. Information is lacking on underground natural gas local delivery lines. No natural gas lines are known to exist in the shoreline jurisdiction. A GIS layer for overhead local delivery power lines is also lacking. There are power poles in the River Road ROW, and there is power available in many areas of Riverfront Park, as well as to the ballfields and the PUD pump house. Existing utility lines can be seen in Map 4.1. The City maintains two utilities in or near the shoreline jurisdiction; stormwater and sanitary sewer.

Stormwater Utility
There are two small stream channels that are part of the area's stormwater drainage pattern, thus these channels are considered as stormwater utility infrastructure in the shoreline jurisdiction. One channel is downstream of the discharge area for the City's stormwater system. The stormwater system in NOT combined with any sanitary sewer pipes. A second stream channel on the east side of the jurisdiction drains rural areas east of town; little, if any, stormwater from the City affects this channel. The City's Stormwater rules apply to this stormwater utility, as does the City's Phase 2 National Pollutant Discharge Elimination System (NPDES) permit with Ecology. Under the Phase II permit, the City is required to implement a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the City's municipal stormwater system to the maximum extent practicable and to protect water quality. Under the conditions of the permit, the City must protect and improve water quality through public education and outreach, detection and elimination of illicit non-stormwater discharges (e.g., spills, illegal dumping, wastewater), management and regulation of construction site runoff, management and regulation of runoff from new development and redevelopment, and pollution prevention and maintenance for municipal operations.

Sanitary Sewer
The City provides sewer services to all areas located within the City, collecting and treating wastewater at the Wastewater Treatment Plant located at the edge of the 100 year floodplain but well outside shoreline jurisdiction. The shoreline jurisdiction is not served by the City sewer system, therefore there is no sewer infrastructure in the jurisdiction. The Sedro-Woolley wastewater plant discharges into Skagit River West of the shoreline jurisdiction. Discharge has received primary and secondary treatments before being released to the river. Discharges from the plant are regulated by the Washington Department of Ecology under

NPDES permits, which includes performance standards and monitoring requirements. The Sedro-Woolley Wastewater treatment plant has been awarded the Outstanding Performance Award from Ecology 11 of the past 13 years, including the past 5 years consecutively.

Impervious Surfaces and Vegetation

As noted above, impervious surfaces have the potential to affect shorelines, hydrology and water quality. The City operates under a Phase II stormwater permit from Ecology and has a compliant stormwater utility. The shoreline jurisdiction is characterized by uses put in place before stormwater regulations were developed. In total there are approximately 6.5 acres of impervious driving surfaces in the shoreline jurisdiction. Roughly 55% of that impervious surface is in gravel parking areas in Riverfront Park, the RV park and the boat launch parking lot. River Road makes up about 30%, and parking areas on the north side of River Road accounts for about 15% of the impervious surface in the area. Vegetation in the shoreline jurisdiction largely consists of maintained grass fields, of which there are approximately 15.75 acres. Much of this maintained area is regularly used play area and ballfields, but some of it is easily maintained landscaping for the assisted living facility.

An area of tree and brush cover (approximately 10 acres) lies in the northeast portion of the shoreline jurisdiction. Most of the tree cover (approximately 12.5 acres) lies near the river, primarily in the western portion of the park. The understory is comprised largely of salmonberry where there is an understory. Other areas have unmaintained grass or are sparsely vegetated. The BMX riders may have an affect on the vegetation in this area, however it is unknown how hydrology, soils or human alteration has affected the vegetation in the shoreline jurisdiction. No studies of the vegetation in this area, or any other part of the jurisdiction, have been performed. There is room for additional studies of the vegetation in the area.

Shoreline Modifications

The Skagit River is a historically dynamic river. Since the removal of the logjams that the river was known for, as well as other human modifications such as the upriver dams, the river has maintained its current river channel in the area adjacent to Sedro-Woolley. There is no armoring on the north bank of the Skagit River where it is adjacent to the City's shoreline jurisdiction. Historic dredging or filling is not known; this is another area where information is lacking. Observations of the shoreline offer no indication of recent human modification of the river bank through this stretch, with one exception. There is a concrete boat launch on the eastern side of Riverfront Park.

Public Access Areas

The shoreline jurisdiction is almost entirely in public ownership. The only restrictions to public access in the area is signage and fencing in place on some high-bank areas to discourage access for safety reasons. The River runs swiftly past the shoreline jurisdiction, and the cold water temperatures make the river unsafe without watercraft.

There is a public boat launch and handicapped accessible fishing area at Riverfront Park. In addition, there are some low-bank sections that make river access possible for those willing to walk off of paved surfaces using an impromptu trail system. Because most of the shoreline jurisdiction is in public ownership, additional recreation opportunities may be possible in the future. Floodway restrictions will dictate acceptable uses in the shoreline jurisdiction. Current inventory of uses include:

- Baseball fields
- Off-leash dog park
- Boat launch
- RV campground
- Play equipment
- Amphitheater
- Multiple picnic shelters
- Trails
- Fishing
- BMX and mountain bike course (unofficial feature)
- Basketball court
- Public restrooms
- Open fields (used for car show, carnival, other community gatherings)

Critical Areas

Chapter 17.65 SWMC contains critical areas regulations for wetlands, aquifer recharge areas, geologically hazardous areas, fish and wildlife conservation areas and frequently flooded areas. The inventory of critical areas was based on a wide range of information sources, including City GIS, critical area inventories, Washington Department of Fish and Wildlife databases, and other relevant maps and literature obtained from the Washington Department of Natural Resources (DNR), Ecology, National Marine Fisheries Service, and U.S. Fish and Wildlife Service. Map 5.1 and 5.2 indicate known critical areas.

Wetlands

Wetlands and riparian corridors serve many important ecological and environmental functions and help to protect public health, safety and welfare by

providing flood storage and conveyance, erosion control, fish and shellfish production, fish and wildlife habitat, recreation, water quality protection, water storage, education, scientific research and other public benefits. Article II of Chapter 17.65 SWMC addresses the protection of these functions to prevent the continual loss of wetlands and riparian corridors, and where practical to enhance or restore wetlands and riparian corridors functions and values. The attached maps include wetlands inventoried by the Department of Fish and Wildlife National Wetland Inventory (NWI). Any wetlands that have been found as part of a development application and delineated by an recognized wetland scientist have been added to the City's GIS database; no such wetland occur in or near the shoreline jurisdiction. There do not appear to be any wetlands in the shoreline jurisdiction based on existing wetland mapping information.

The NWI shows that some wetlands within the 100 year flood plain cross into City limits. These wetlands are under SMP jurisdiction.

Aquifer Recharge Areas

Article III of the Sedro-Woolley COA addresses areas with a critical recharging effect on aquifers used for potable water. Potable water is an essential life-sustaining element. Sedro-Woolley's drinking water comes from Public Utility District #1, rather than groundwater supplies. Once groundwater is contaminated, it is difficult, costly, and sometimes impossible to clean-up. It is the purpose of Article III to prevent contamination and depletion, avoid exorbitant clean-up costs, hardships and potential physical harm to people. Inventory research has not found GIS mapping of aquifer recharge areas to be available for Sedro-Woolley. There is an apparent information gap in the aquifer recharge data, however, no aquifer recharge areas are known within shoreline jurisdiction. There are some existing wells in the City limits that are not mapped. The shoreline jurisdiction is served by PUD water, and there are no known wells in the area. There are two known septic systems in the jurisdiction.

Fish and Wildlife Habitat Conservation Areas

In addition to their intrinsic value, certain species of fish and wildlife represent important historic, cultural, recreational and economic resources. Many species serve as indicators of the condition of the environment and the quality of life that local residents have invested in, enjoy and respect. It is the purpose of this chapter to protect, restore where practical, and enhance fish and wildlife populations and their associated habitats. Riparian areas are generally the areas subject to protection under Article V – Chapter 17.65. The Skagit River and its buffer, as well as the two known intermittent stream channels fall under the purview of Article V. Only the Skagit River is designated as anadromous fish habitat. There are roughly 1,400 linear feet of Skagit River shoreline in Sedro-Woolley.

Through this section, the river is highly channelized and swift moving with mostly steep banks. Per Table 34 of the *Skagit County DRAFT Shoreline Analysis Report for Shorelines in Skagit County and the Towns of Hamilton and Lyman*, the stretch of river (reaches 221, 222 and 225) adjacent to Sedro-Woolley scores very low on the Reach Functional Analysis Scores for Management scale.

The Department of Fish and Wildlife's 2009 GIS data for Bald Eagle nests was consulted to determine if there are any eagle nests in or near the jurisdiction. There are no known nests or mapped nests. Because there are no listed nests and nest locations are considered proprietary information, the eagle nest locations layer has not been included on the attached maps.

In general, the existing land uses in the jurisdiction – which are almost entirely park uses – are compatible with wildlife functions. However, as noted in the following section on restoration opportunities, there are opportunities to enhance wildlife habitat in the shoreline jurisdiction.

Frequently Flooded Areas

It is the purpose of Article V – SWMC 17.65 to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in the floodplain and the floodway. A separate section of the zoning code, Chapter 17.66 SWMC, also addresses the protection of development from flood damage.

The shoreline jurisdiction is comprised of the FEMA designated floodway and an additional 200 feet landward, but inside the 100 year floodplain. Therefore the jurisdiction is subject to the rules affecting frequently flooded areas. There is little potential for commercial, residential or other non-recreational development in the shoreline jurisdiction. The properties in the shoreline jurisdiction are publicly owned, with the exception of one property that is mostly out of the jurisdiction and is already developed to its maximum potential.

<u>Channel Migration Zones and Floodplains</u>

Floodplain boundaries were developed from the FEMA FIRM, Skagit County 100 year flood mapping, and the Sedro-Woolley GIS layers. Maps 1.1, 1.2, 2.1 and 2.2 show the 100 year floodplain.

According to definitions in Ecology's Shoreline Master Program Guidelines (WAC 173-26-020), "'Channel migration zone (CMZ)' means the area along a river within which the channel(s) can be reasonably predicted to migrate over time as a result of natural and normally occurring hydrological and related processes when considered with the characteristics of the river and its surroundings."

River channels can move, or migrate, laterally across their floodplains. Channel migration can occur gradually, as a river erodes one bank and deposits sediment along the other. Channel migration also can occur as an abrupt shift of the channel to a new location, called an avulsion, which may happen during a single flood event, creating hazards to nearby structures. The highest rates of channel migration occur in zones of rapid sediment deposition, e.g., where steep rivers flow out of foothills onto flatter floodplains. Channel migration represents a different type of flood hazard than getting inundated by overbank flow, and can endanger properties located outside of the regulatory floodplain (http://www.kingcounty.gov/environment/waterandland/flooding/maps/migration.aspx).

In the Sedro-Woolley vicinity there are no steep rivers emptying into the Skagit River, a scenario that increases the likelihood of river migration. The City of Sedro-Woolley has not determined the channel migration potential in the shoreline jurisdiction. Additional research is forthcoming and is highly dependant on results of the Skagit Count CMZ mapping of the Skagit River upstream and downstream of the Sedro-Woolley shoreline jurisdiction.

The river channel has been static in the in recent history. Channel migration has been analyzed by Skagit County based on Ecology's criteria and has elected to define the Skagit River CMZ very broadly and through the Sedro-Woolley area, the CMZ extends approximately 10,000 feet (1.89 miles) landward from the city's shoreline jurisdiction. This places the extent of the CMZ near the northern border of the city, approximately 11,500 feet (2.17 miles) northward from the river bank. Based on the recent history of the river channel and the lack of steep rivers affecting the city's shoreline jurisdiction, river migration is not anticipated in the near future. However the city is aware of the potential for channel migration.

The floodplain extends northward from the river bank to a steep embankment at the south portion of the city's developed area. This embankment is the approximate edge of the 100 year floodplain. The only development below the bank is parks infrastructure such as ball fields and play equipment; infrastructure that will neither impede floodwaters nor be severely damaged as a result of a flood. There are some impervious surfaces in the floodplain that may affect overland storm and floodwater infiltration. However, the amount of impervious area is a small portion of the overall shoreline jurisdiction within the floodplain and is not likely to have an ill affect on infiltration rates or water quality.

Archeological and Historical Resources

The Washington State Department of Archaeology and Historic Preservation (DAHP) maintains a GIS layer containing of a series of maps portraying the known location of recorded archaeological and historic sites. The DAHP was consulted to determine if any sites are known in the shoreline jurisdiction; none

are known in this area. DAHP recommends that surveys be performed before any projects are approved in that area based on DAHP predictive modeling. The area is listed within the DAHP's "Survey Highly Advised – Very High Risk" region.

In addition, Skagit County GIS created a separate GIS layer of historical sites in 2002. That GIS layer also did not reveal any known sites. Similarly to the eagle nest data, the historical and archeological site information is sensitive and not necessarily released for public consumption. Because there are no listed sites and the location of sites is considered proprietary information, the historical and archeological site locations layer has not been included on the attached maps.

Areas of Special Interest

There is anecdotal information that a portion of Riverfront Park was operated as a private solid-waste disposal site prior to the city taking ownership. The highest area in the park is understood to be layer of soil over mounded garbage. That hill is the highest point in the preliminary shoreline jurisdiction. The structures on top of the hill area not known to have ever flood, thus it is assumed that the top of the hill is possibly out of the flood way, potentially out of the 100 year floodplain; this information cannot be determined conclusively from the FEMA FIRM map and floodway maps, as those maps show evidence of inaccurate data. Information about the years of operation and any potential hazards is sparse. Ongoing research is necessary, but the site is known and appropriate measures to avoid interaction with the subsoil taken by the City. The structures on the hill are thought to have been constructed in the mid to late 1970's.

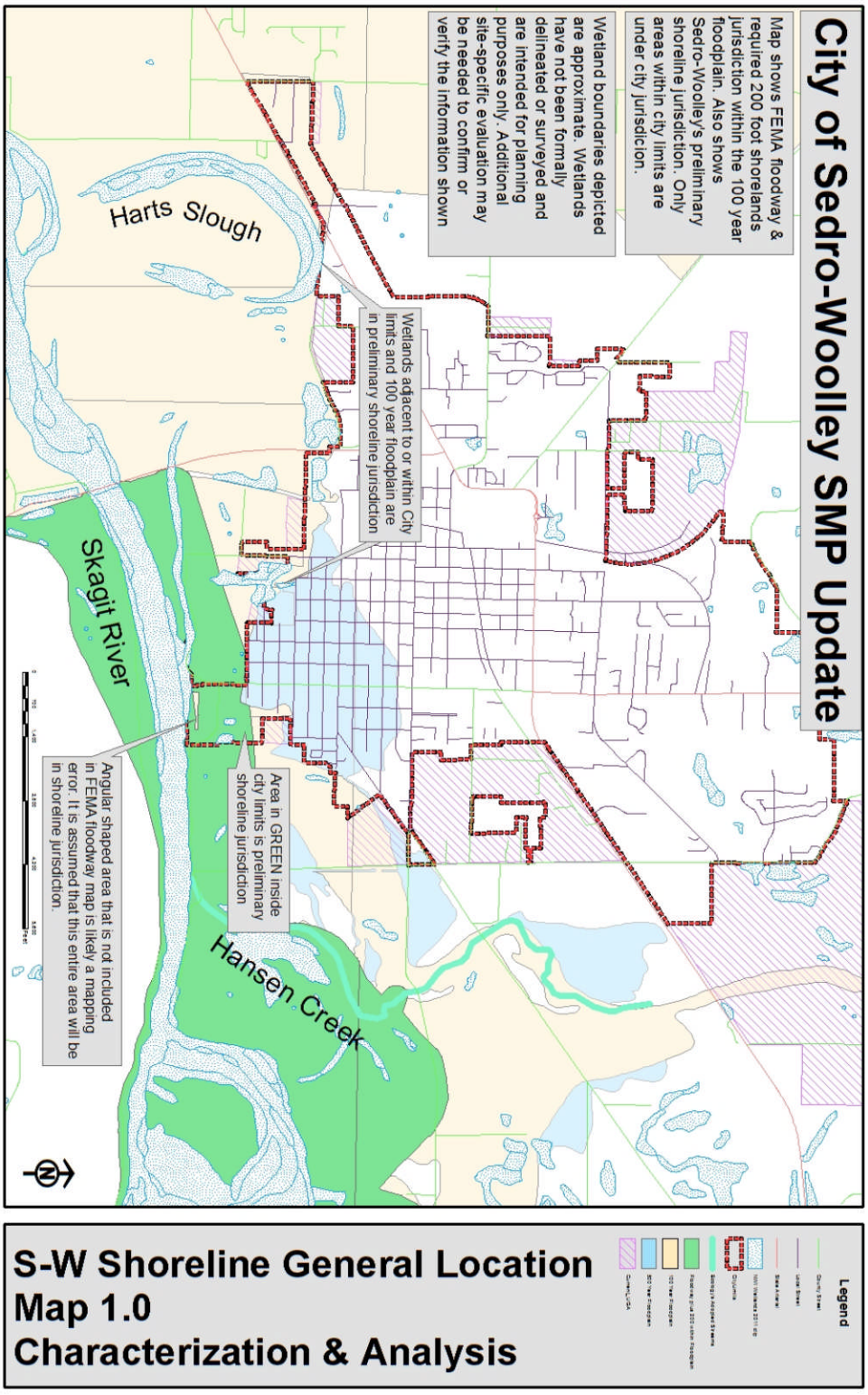
Restoration Opportunities

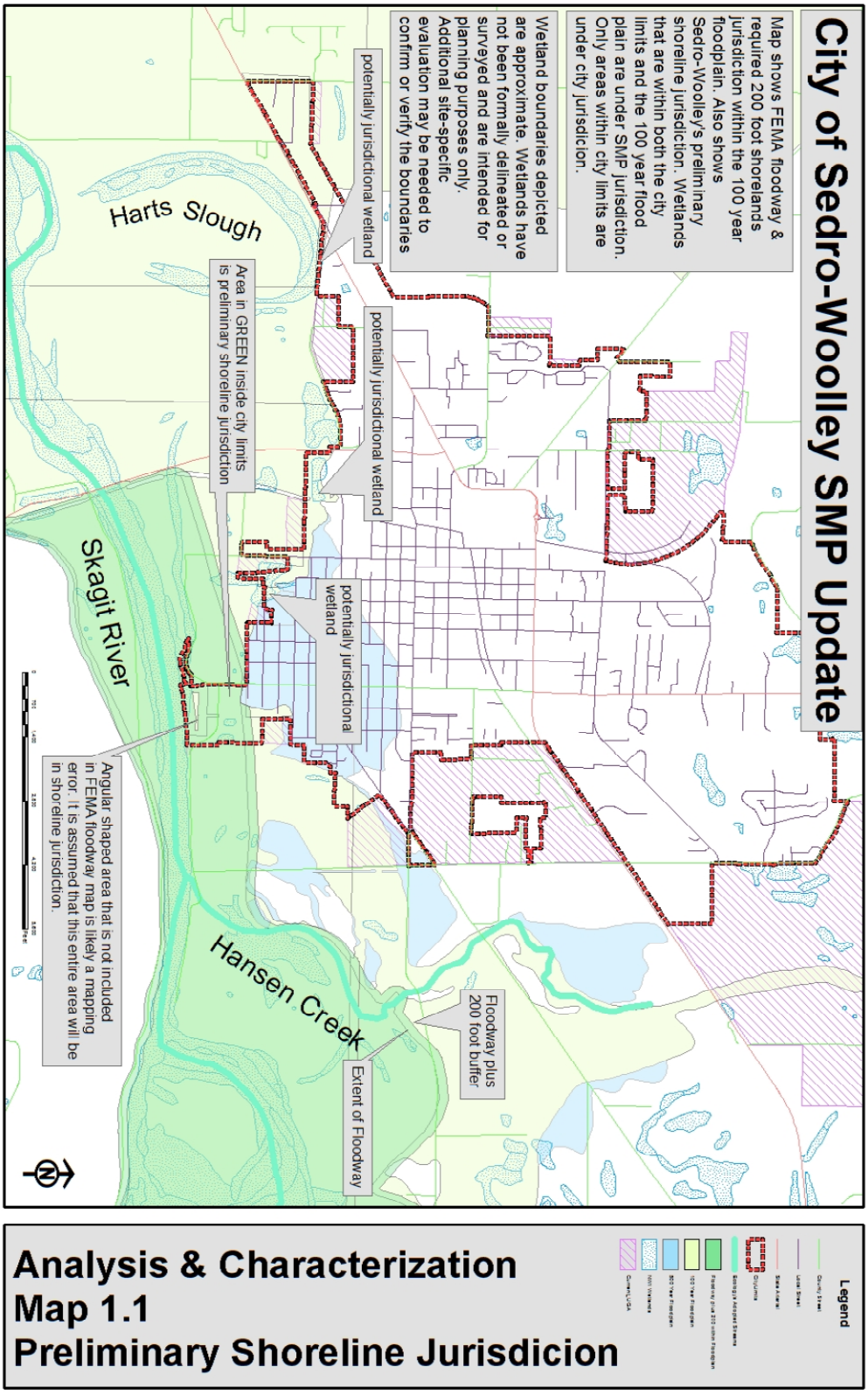
The above referenced solid waste disposal site represents a potential restoration opportunity, tough permitting and financial constraints may complicate the issue. The structures built atop the mound, as well as community sentiment towards the long standing park feature.

Other plant restoration opportunities exist in the northeast section of the jurisdiction where the vegetation is unmanaged. Invasive weeds have taken foothold in large portions of this area eliminating the opportunity for public access and creating a less desirable species habitat. Public-private partnerships to plan and execute a vegetation enhancement project may be explored. Upcoming public comment periods may be used to develop further restoration opportunities concepts within Sedro-Woolley's shoreline jurisdiction.

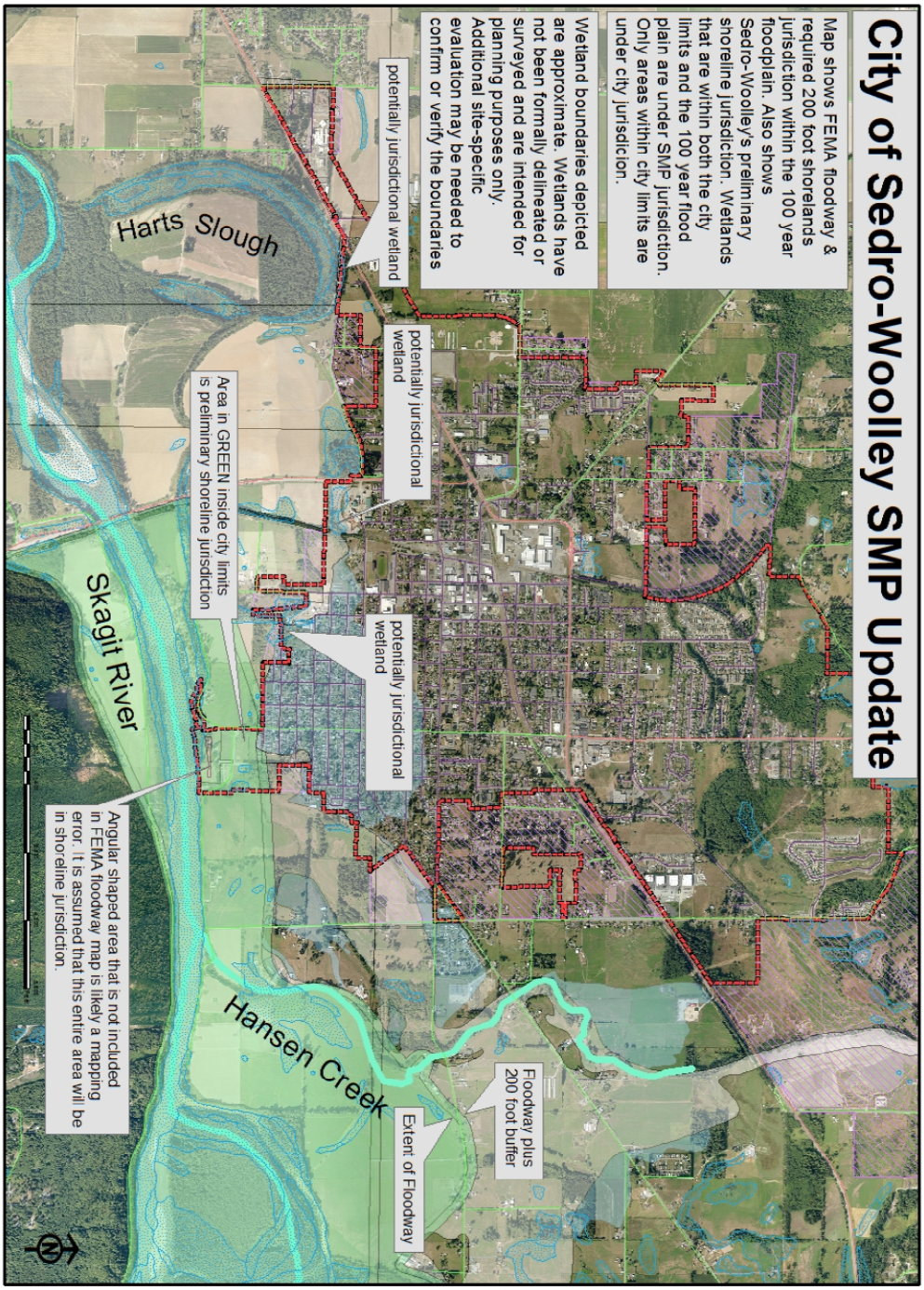
Map Portfolio

Map 1.1 – Preliminary Shoreline Jurisdiction
Map 1.2 – Preliminary Shoreline Jurisdiction – aerials
Map 2.1 – Preliminary Shoreline Reach
Map 2.2 – Preliminary Shoreline Reach – aerials
Map 3.1 – Land Use
Map 3.2 – Land Use – aerials
Map 3.3 – Land Use – photos
Map 4.1 – Utilities

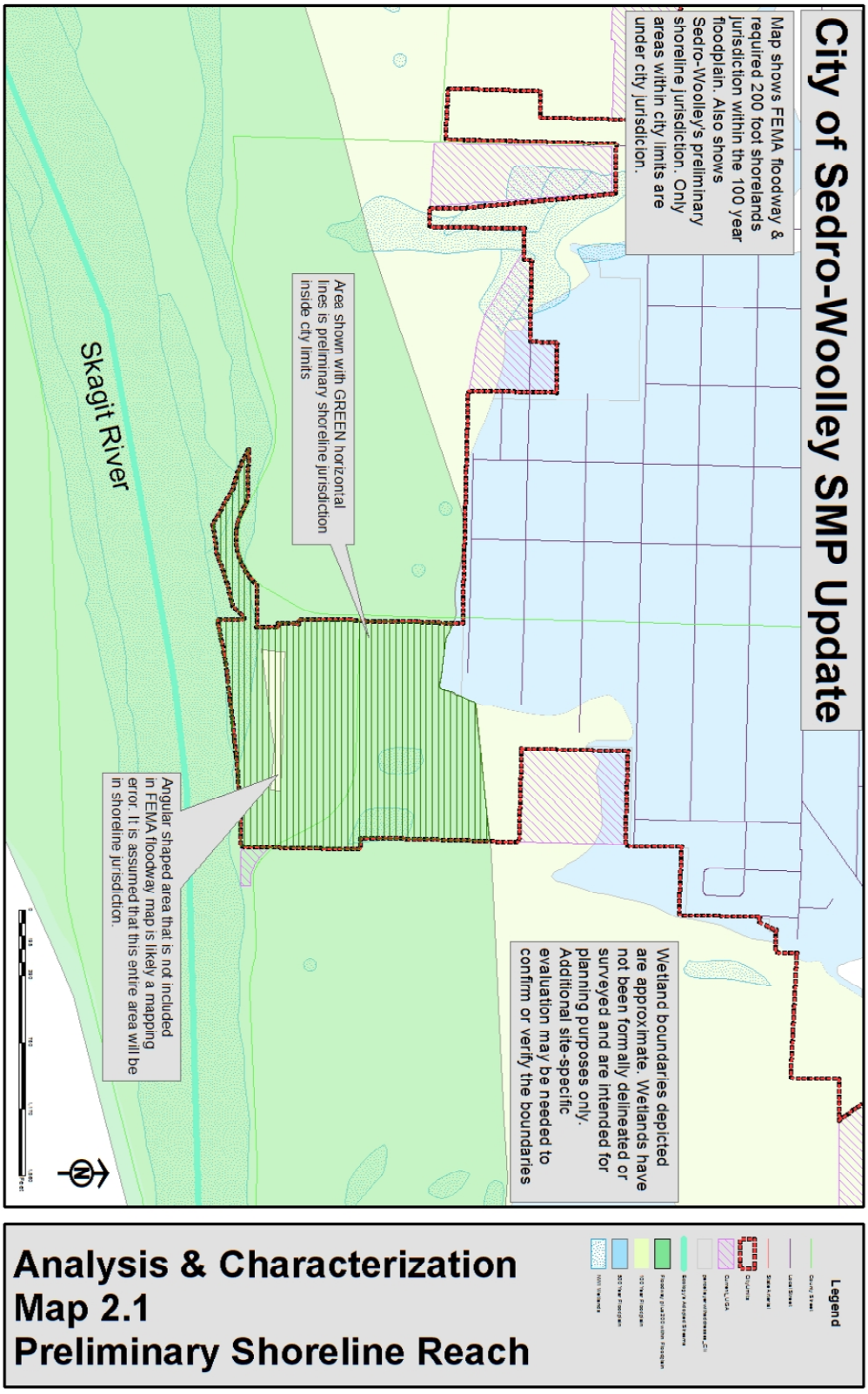

City of Sedro-Woolley SMP Update
Map shows FEMA floodway & required 200 foot shorelands jurisdiction within the 100 year floodplain. Also shows Sedro-Woolley's preliminary shoreline jurisdiction. Only areas within city limits are under city jurisdiction.
Wetland boundaries depicted are approximate. Wetlands have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluation may be needed to confirm or verify the information shown
Harts Slough
Wetlands adjacent to or within City limits and 100 year floodplain are in preliminary shoreline jurisdiction
Skagit River
Area in GREEN inside city limits is preliminary shoreline jurisdiction
Angular shaped area that is not included in FEMA floodway map is likely a mapping error. It is assumed that this entire area will be in shoreline jurisdiction.
Hansen Creek
Legend
S-W Shoreline General Location
Map 1.0
Characterization & Analysis

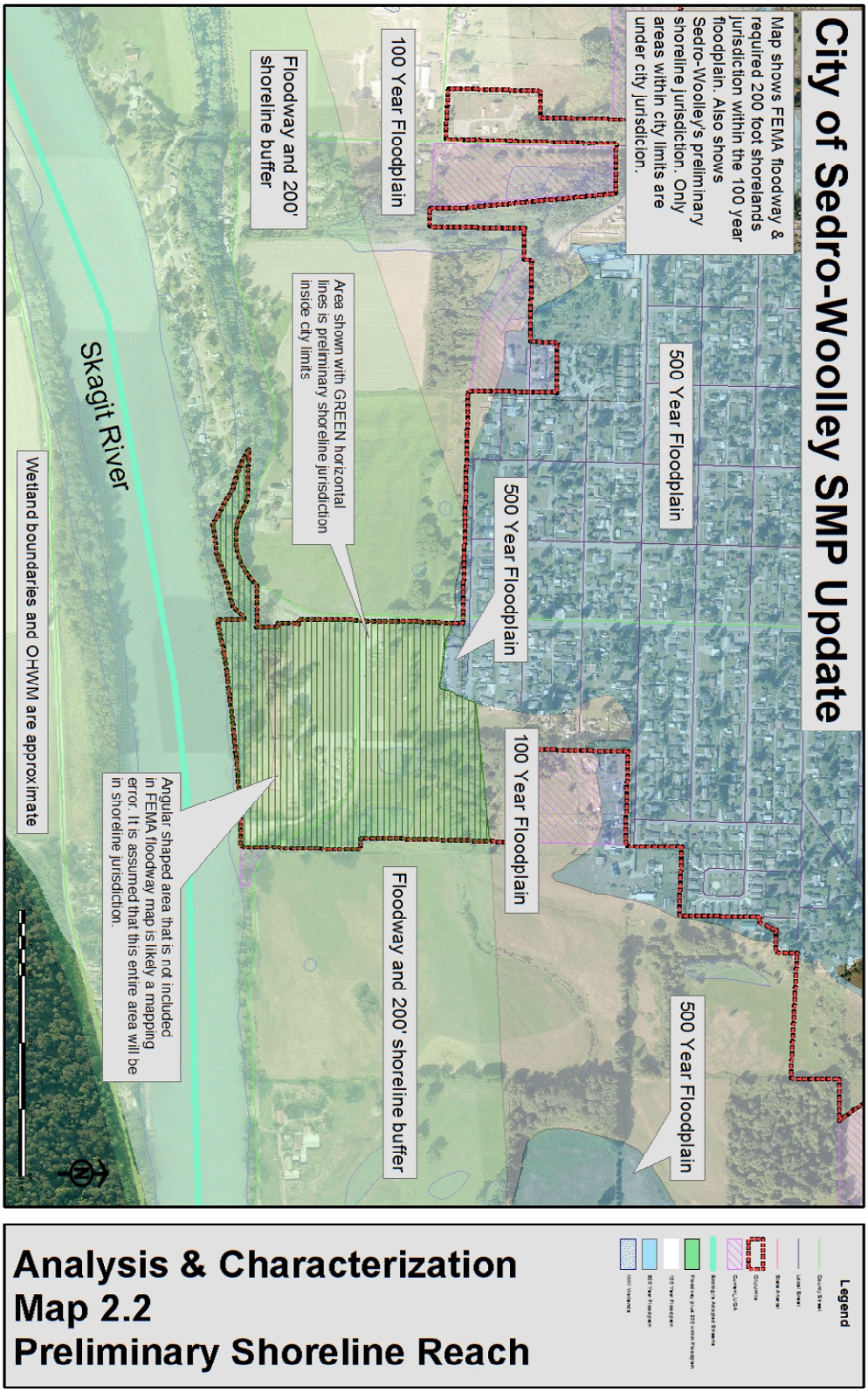


Analysis & Characterization
Map 1.1
Preliminary Shoreline Jurisdicion

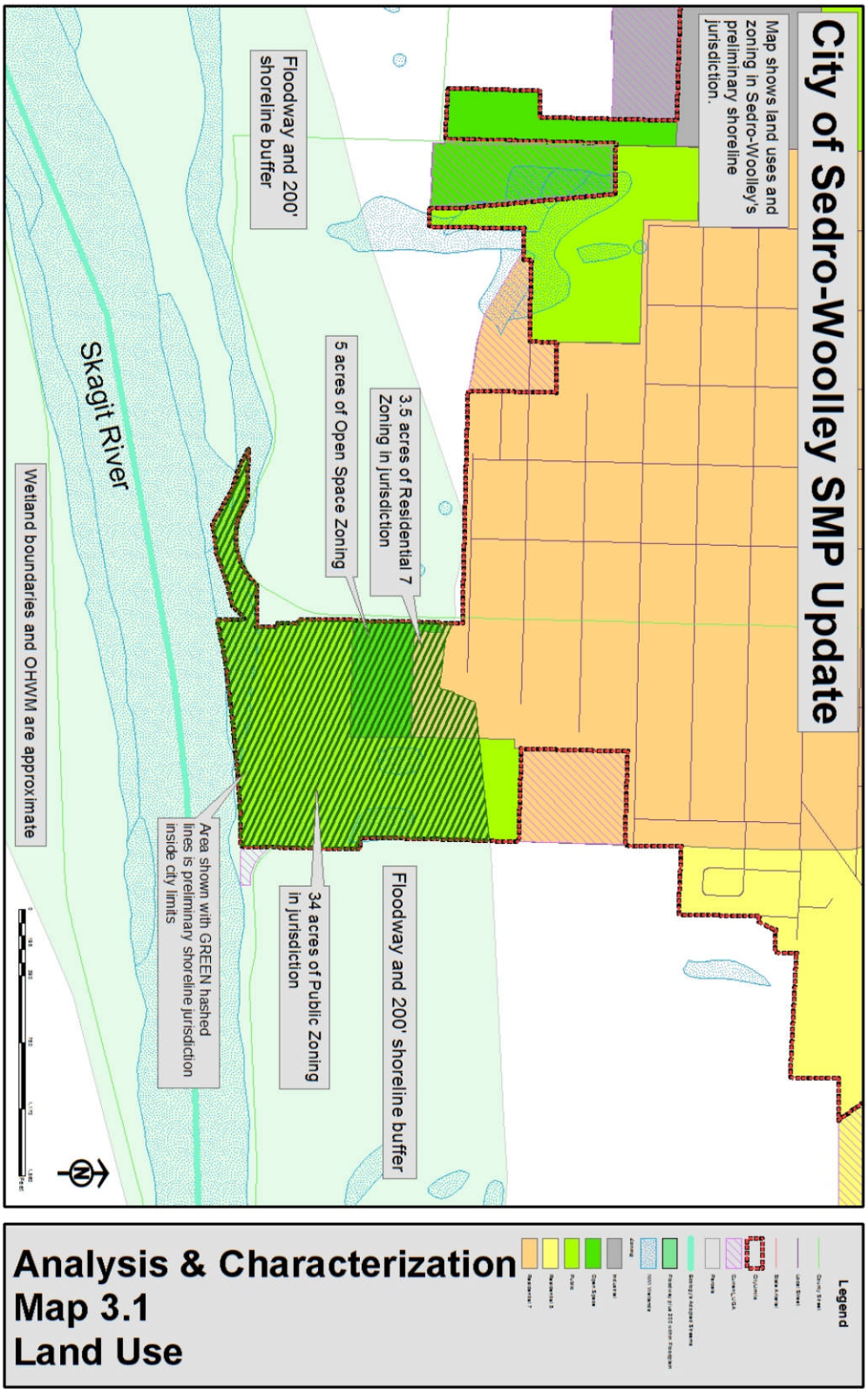


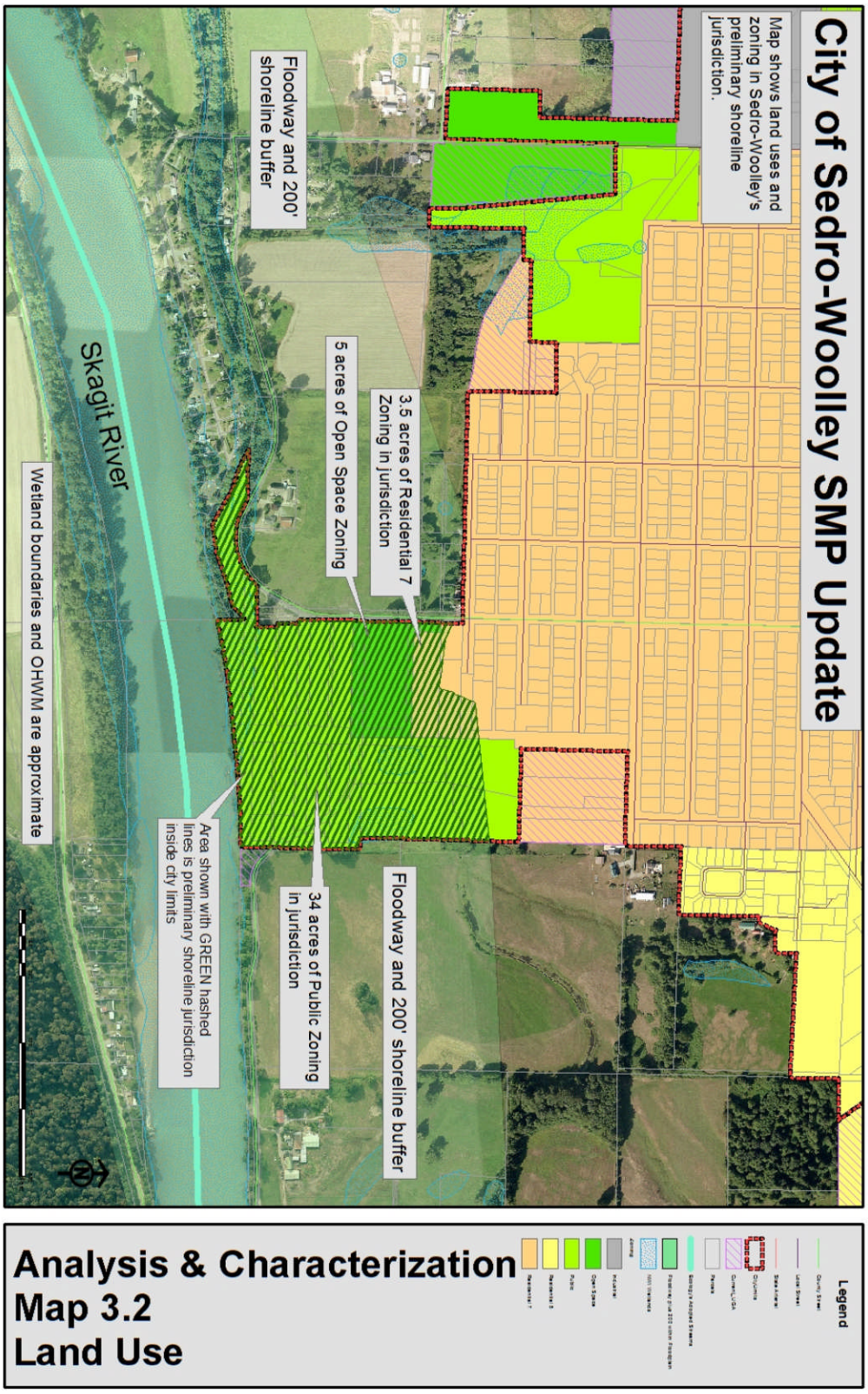
Analysis & Characterization
Map 1.2
Preliminary Shoreline Jurisdicion


City of Sedro-Woolley SMP Update
Map shows FEMA floodway & required 200 foot shorelands jurisdiction within the 100 year floodplain. Also shows Sedro-Woolley's preliminary shoreline jurisdiction. Only areas within city limits are under city jurisdiction.
Area shown with GREEN horizontal lines is preliminary shoreline jurisdiction inside city limits
Wetland boundaries depicted are approximate. Wetlands have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluation may be needed to confirm or verify the boundaries
Angular shaped area that is not included in FEMA floodway map is likely a mapping error. It is assumed that this entire area will be in shoreline jurisdiction.
Skagit River
Legend
Analysis & Characterization
Map 2.1
Preliminary Shoreline Reach

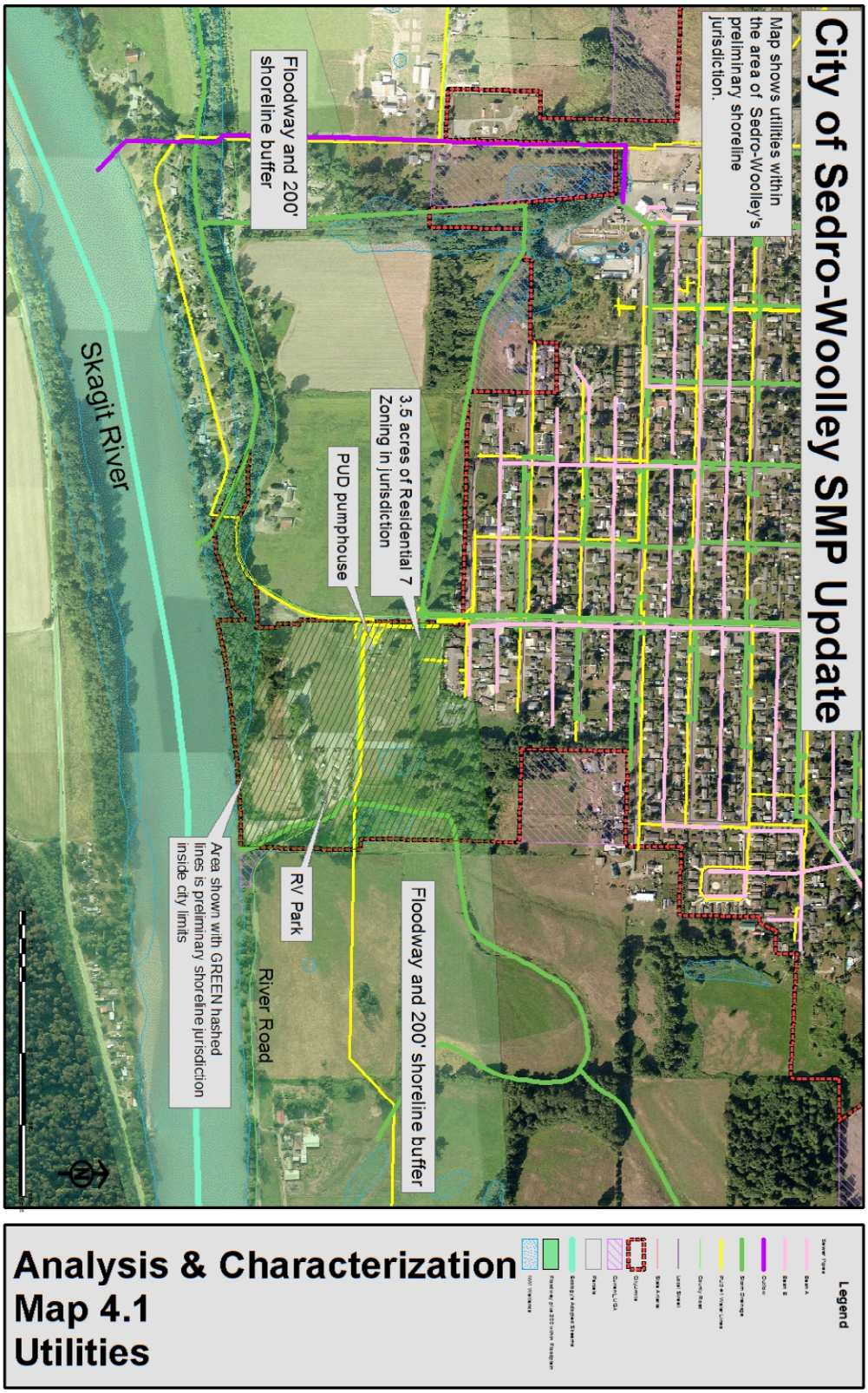


Analysis & Characterization
Map 2.2
Preliminary Shoreline Reach


City of Sedro-Woolley SMP Update
Map shows land uses and zoning in Sedro-Woolley's preliminary shoreline jurisdiction.
Floodway and 200' shoreline buffer
5 acres of Open Space Zoning
3.5 acres of Residential 7 Zoning in jurisdiction
Skagit River
Wetland boundaries and OHWM are approximate
Area shown with GREEN hashed lines is preliminary shoreline jurisdiction inside city limits
34 acres of Public Zoning in jurisdiction
Floodway and 200' shoreline buffer
Legend
Analysis & Characterization
Map 3.1
Land Use


City of Sedro-Woolley SMP Update
Map shows land uses and zoning in Sedro-Woolley's preliminary shoreline jurisdiction.
Floodway and 200' shoreline buffer
5 acres of Open Space Zoning
3.5 acres of Residential 7 Zoning in Jurisdiction
Floodway and 200' shoreline buffer
34 acres of Public Zoning in jurisdiction
Area shown with GREEN hashed lines is preliminary shoreline jurisdiction inside city limits
Wetland boundaries and OHWM are approximate
Skagit River
Legend
Analysis & Characterization
Map 3.2
Land Use

City of Sedro-Woolley SMP Update
Map shows some of the existing uses in the preliminary shoreline jurisdiction.
Floodway and 200' shoreline buffer
Wetland boundaries and OHWM are approximate
Skagit River
Baseball Fields
Bark Park
RV Park
Boat Launch
Riverfront Park
Legend
Analysis & Characterization
Map 3.3
Land Use


City of Sedro-Woolley SMP Update
Map shows utilities within the area of Sedro-Woolley's preliminary shoreline jurisdiction.
Floodway and 200' shoreline buffer
Skagit River
3.5 acres of Residential 7 Zoning in Jurisdiction
PUD pumphouse
RV Park
River Road
Floodway and 200' shoreline buffer
Area shown with GREEN hashed lines is preliminary shoreline jurisdiction inside city limits
Legend
Analysis & Characterization
Map 4.1
Utilities